Vol. 10. No. 8. pp. 573-648. August, 1940

IMPERIAL MYCOLOGICAL INSTITUTE
31 JUL 1940

THE VETERINARY BULLETIN

1940

WEYBRIDGE:
IMPERIAL BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
ENGLAND

Price 5/- net

Annual Subscription £2

Imperial Agricultural Bureaux.

EXECUTIVE COUNCIL.

F. J. DU TOIT, *Chairman*	Union of S. Africa.
Dr WILLIAM ALLEN, *Vice-Chairman*	Canada.
Sir DONALD FERGUSSON, K.C.B.	United Kingdom.
F. L. McDOUGALL, C.M.G.	Australia.
NEVILL L. WRIGHT, F.I.C., D.I.C.	New Zealand.
J. M. ADAMS, F.R.C.Sc. (I)	Eire.
D. JAMES DAVIES, C.B.E.	Newfoundland.
SHAMALDHARI LAL, Deputy High Commissioner	India.
B. F. WRIGHT...	Southern Rhodesia.
SHAMALDHARI LAL, Deputy High Commissioner for India ...	Burma.
J. A. CALDER, C.M.G.	Colonies, Protectorates and Mandated Territories.
Sir DAVID CHADWICK, K.C.M.G., C.S.I., C.I.E.	Secretary.

STAFF OF IMPERIAL BUREAU OF ANIMAL HEALTH, WEYBRIDGE.

Director:
W. HORNER ANDREWS, D.Sc., M.R.C.V.S.

Deputy Director and
Editor of The Veterinary Bulletin and of Index Veterinarius:
W. A. POOL, M.R.C.V.S.

Second Officer:
J. TWEEDALE EDWARDS, M.R.C.V.S.

CONTENTS

LIST OF CHIEF SUBJECTS

[Many subjects dealt with are omitted from the list and will be found in the appropriate places. Particular subjects sometimes appear under different headings: *e.g.* Tuberculosis may appear under :– Diseases Caused by Bacteria and Fungi; Immunity; Diseases, General (papers on several diseases); Public Health; Therapeutics; Technique; Reports and Book Reviews].

	PAGE
DISEASES CAUSED BY BACTERIA AND FUNGI [see also Immunity] ...	573–583
Mastitis	573
Anthrax	574
Tuberculosis	575
Brucellosis	580
DISEASES CAUSED BY PROTOZOAN PARASITES	583–585
Trypanosomiasis	584
DISEASES CAUSED BY VIRUSES ...	585–590
Rinderpest	585
Foot and mouth disease	586
Rabies	588
PARASITES IN RELATION TO DISEASE [ARTHROPODS]	590–592
Warble flies	590
Midges	590
Ticks	591
PARASITES IN RELATION TO DISEASE [HELMINTHS]	592–598
Trematodes	592
Cestodes	592
Nematodes	593
IMMUNITY [including Allergic and Serological Diagnosis] ...	599–602
DISEASES, GENERAL [General diseases not dealt with under other headings: Organic Diseases, Miscellaneous Diseases and Neoplasms]	602–610
NUTRITION IN RELATION TO DISEASE [Articles placed in the section "Diseases, General" may also contain references to nutritional factors]	611–616
Mineral deficiency	611
Vitamin deficiency	613
PUBLIC HEALTH	616–617
Milk hygiene	616
Meat hygiene	617
THERAPEUTICS	617–622
POISONS AND POISONING ...	622–624
PHYSIOLOGY	624–629
TECHNIQUE AND APPARATUS ...	630–632
MISCELLANEOUS	632–636
REPORTS	636–645
Great Britain	636, 640
Australia	637
South Africa	638
Burma	639
Nigeria	639
New Zealand	640
Northern Rhodesia	642
Jamaica	643
Antigua	643
Denmark	644
Sweden	645
U.S.A.	645
BOOK REVIEWS	645–648

INDEX TO AUTHORS

Alkashev, D. N. See Muratov, E. A., jt. author, 581.
A.R.P. Handbook No. 12, 634.
A.R.P. Nat. Anim. Comm. : Wartime Aids, 634.
Alföldy, J. See Országh, O., jt. author, 601.
Amies, C. R., & Carr, J. G., 609.
Antigua : Rep. vet. Offr., 1938, 643.
Aubertin, P. See Laigret, J., jt. author, 630.
Australia, New South Wales, 637.
—, Queensland, 638.

Bakker, T. See Picard, F. H. J., jt. author 613.
Balozet, L., 588.
Baranov, N., 590.
Barcroft, J., Barron, D. H., Cowie, A. T., & Forsham, P. H., 626.
—, Kennedy, J. A., & Mason, M. F., 626.
Bárdosi, Z., 624.
Barr, C. G., Reuszer, H. W., & Thorp, F., Jr., 624.
Barron, D. H. See Barcroft, J., et al., jt. authors, 626.
Bauernfeind, J. C. See Norris, L. C., jt. author, 613.
Baumann, T., 576.
Bayron, M. See Saleun, G., et al., jt. authors, 584.
Beard, J. W., Finkelstein, H., & Wyckoff, R. W. G., 589.
—. See also Sprunt, D. H., et al., jt. authors, 589.
Beaudette, F. R. See Metzger, H. J., et al., jt. authors, 630.
Bechdal, S. I. See Flora, C. C., et al., jt. authors, 614.
Beck, C., 648.
Belschner, H. G., 637.
Bequignon, R. See Levaditi, C., et al., jt. authors, 589.
Bernadskaya, Z. M. See Bogoroditskiĭ A. V., et al., jt. authors, 620.
Bernát, J., 625.
Berthelon, M., & Goret, P., 589.
Best, C. H., 621.
Biester, H. E. See Schwarte, L. H., et al., jt. authors, 623.
Bilal, 616.
Bilal, S., 591.
Birkhaug, K., 599.
Blount, W. P., 625.
Boddie, G. F., 617.
Bogoroditskiĭ, A. V., Bernadskaya, Z. M., & Lavrent'ev, P. A., 620.
—, & Lavrent'ev, P. A., 620.
Bollman, J. L. See Flock, E. V., et al., jt. authors, 629.
Bradfield, E. W. C., 633.
Brayton, N. L. See Turner, T. B., jt. author, 631.
Britton, J. W., 597.
Brooks, P. B., 617.
Brown, G. L., & Harvey, A. M., 612.
Brown, T. M. See Swift, H. F., jt. author, 582.
Bryan, C. S., 616.
Bull. Off. internat. Epiz., 575.
Bull. Soc. vét. prat. Fr., 586.
Burma, 639.
Bushnell, L. D., Frick, E. J., & Twiehaus, M. J., 646.

Cabot, D. A. E., 632.
Canič, R. See Fleischhauer, G., jt. author, 599.
Carleton, H. M., & Leach, E. H., 630.
Carr, J. G. See Amies, C. R., jt. author, 609.
Chabot, C. See Rinjard, P., et al., jt. authors, 587.
Charvet, P. See Michel-Béchet, R., et al., jt. authors, 648.
Chichester, D. F., Russell, W. C., & Hudson, C. B., 613.
Chitty, D., 603.
—, & Elton, C., 603.
Coleman, F. B., 638.
Colvin, J. W., & Mills, C. A., 606.
Cowie, A. T. See Barcroft, J., et al., jt. authors, 626.
Crezée, B., 611, *bis*.
Culbertson, J. T., 584.

Darraspen, E., Florio, R., & Meymandi, M., 606.
Denmark, 644.
Descazeaux, J., 594, *bis*.
Deschiens, R., 594, *ter*.
Dienes, L., & Sullivan, E. R., 582.
Dildine, S. C., 576.
Dimock, W. W., & Errington, B. J., 611.
Djaenoedin, R. See Kraneveld, F. C., jt. author, 575.
Dmochowski, L., & Knox, R., 609.
—. See also Foulds, L., jt. author, 610.
Dobrynina, V. I., 623.
Downham, K. D., 583.
—, & Yarrow, T. B., 604.
Dubos, R. J. See Smadel, J. E., et al., jt. authors, 589.
Duckworth, J., & Godden, W., 629.
—. See also Godden, W., jt. author, 629.
Dukalov, I. A., 588.
Dumfries (County), 640.
Dunlop, G., Innes, J. R. M., Shearer, G. D., & Wells, H. E., 612.
Dutcher, R. A. See Flora, C. C., et al., jt. authors, 614.

Eden, A., 635.
Edwards, S. J., 573.
Elton, C. See Chitty, D., jt. author, 603.
Enders, J. F. See Hammon, W. D., jt. author, 606.
Endrejat, E., 574.
Enigk, K. See Wetzel, R., jt. author, 583, 597.
Errington, B. J. See Dimock, W. W., jt. author, 611.
Evans, G. M. See Gaisford, W. F., et al., jt. authors, 618.
Eveleth, D. F. See Eveleth, M. W., et al., jt. authors, 612.
—. See also Schwarte, L. H., et al., jt. authors, 623.
Eveleth, M. W., Eveleth, D. F., & Walsh, F. E., 612.

Finkelstein, H. See Beard, J. W., et al., jt. authors, 589.
Flaum, A., 587.
Fleischhauer, G., & Canič, R., 599.
Fleming, A., 618.
Fleming, W. L. See Turner, T. B., jt. author, 631.
Flock, E. V., Hester, H. R., & Bollman, J. L., 629.
Flora, C. C., Ward, R. E., Bechdal, S. I., Guerrant, N. B., & Dutcher, R. A., 614.
Florio, R. See Darraspen, E., et al., jt. authors, 606.
Forbes, J. C., & Outhouse, E. L., 622.
Forsham, P. H. See Barcroft, J., et al., jt. authors, 626.
Forssman, J., 573.
Foulds, L., & Dmochowski, L., 610.
Frick, E. J. See Bushnell, L. D., et al., jt. authors, 646.
Frykholm, N., 645.
Fujita, J., 598.

Gaisford, W. F., Evans, G. M., & Whitelaw, W., 618.
de Gier, C. J., 611.
Girlestone, G. R., 576.
Gladstone, G. P., 574.
Godden, W., & Duckworth, J., 629.
—. See also Duckworth, J., jt. author, 629.
Golledge, S. V., 641, *bis*.
Goret, P. See Berthelon, M., jt. author, 589.
Gortner, R. A., Jr., & Lewis, H. B., 622.
Goss, L. J., 608.
Grabar, P., & de Loueiro, J. A., 631.
Graham, R., 576.
—, Hester, H. R., & Levine, N. D., 577.
Grant, J. See Radley, J. A., jt. author, 647.
Gratiolet, G. See Rinjard, P., et al., jt. authors, 587.
Graves, R. R. See Swett, W. W., et al., jt. authors, 605.
Great Britain, Rep. Dev. Comm., 1939, 636.
Guerrant, N. B. See Flora, C. C., et al., jt. authors, 614.

Hagan, W. A., 633.
Haller, E., 629.
Hammon, W. D., & Enders, J. F., 606.
Harvey, A. M. See Brown, G. L., jt. author, 612.
van Haselen, W. H. See Jansen, J., jt. author, 579.
Henchoz, E., 632.
Henrici, A. T., 583.
Hermann, G., 599.
Hester, H. R. See Flock, E. V., et al., jt. authors, 629.
—. See also Graham, R., et al., jt. authors, 577.
Hoff, H. E., Smith, P. K., & Winkler, A. W., 624.
Horsfall, M. W., 593.
Huddleson, I. F., 648.
Hudson, C. B. See Chichester, D. F., et al., jt. authors, 613.
Hülphers, G., 575.
Hupbauer, A., & Zaharija, I., 604.
Hyde, R. R., 606.

Il'inov, S. P., 619.
Innes, J. R. M. See Dunlop, G., et al., jt. authors, 612.
Internat. Direc. agric. Lib., 632.
Isshiki, O., & Ogata, S., 597.
Itabashi, K. See Tazima, T., et al., jt. authors, 578.
Ito, S. See Tazima, T., et al., jt. authors, 578.

Jacotot, H., 577.
Jamaica, 643.
Janisch, R., 573.
Jansen, J., & van Haselen, W. H., 579.
de Jesus, Z., 591.
Jones, V. B., 604.
J. Amer. vet. med. Ass., 636.

Kádár, M., 590.
Kairies, A., & Koch, J., 579.
Kambosseff, S., 610.
Kapp, E. M., 627.
Kaushal, R. S., 605.
Keller, H., & Möller, H., 617.
Kennedy, J. A. See Barcroft, J., et al., jt. authors, 626.
Kikuti, S., 625.
Killham, B. J., 645.
Kindyakov, V. I., 586.
Kirkpatrick, A. C., 638.
Klieneberger, E., 582.
Knox, R. See Dmochowski, L., jt. author, 609.
Koch, J. See Kairies, A., jt. author, 579
Kolodny, M. H., 584.
Kraneveld, F. C. & Djaenoedin, R., 575.
—, & Mansjoer, M., 574.
—, & Umboh, T. E. W., 619.

Kreis, A., 593.
Kremsreiter, J., 579.
Küpfer, M., 647.

Laigret, J., & Aubertin, P., 630.
de Lamarlière, A., 604.
Lamont, H. G., 581.
Lanark (County), 640.
Lancet, 618.
Land, E., 607.
Lavin, G. I. See Smadel, J. E., et al., jt. authors, 589.
Lavrent'ev, P. A. See Bogoroditskiĭ, A. V., jt. author, 620.
—. See also Bogoroditskiĭ, A. V., et al., jt. authors, 620.
Lawrence, D. A., 633.
Leach, E. H. See Carleton, H. M., jt. author, 630.
Lemon, G. C. See Pulvertaft, R. J. V., et al., jt. authors, 620.
Levaditi, C., 589.
—, Reinié, L., & Bequignon, R., 589.
Levine, N. D. See Graham, R., et al., jt. authors, 577.
Lewis, H. B. See Gortner, R. A., Jr., jt. author, 622.
Lindbergh, C. A., 630.
Lisbonne, M., Roman, G., & Renoux, G. 581.
Litchfield, J. T., Jr., White, H. J., & Marshall, E. K., Jr., 618.
Lockett, S., 643.
London (County), 640, *bis.*
Long, P. H. See Marshall, E. K., jt. author, 618.
de Loueiro, J. A. See Grabar, P., jt. author, 631.

McEwen, A. D., 580.
—, & Oxspring, G. E., 580.
Macheboeuf, M., & Mandoul, R., 595.
McHenry, E. W. See MacLean, D. L., et al., jt. authors, 615.
McIntosh, J. See Selbie, F. R., jt. author, 609.
Mackey, A. K. See Pearson, P. B., et al., jt. authors, 614.
McKim, O. E., 634.
MacLean, D. L., Sheppard, M., & McHenry, E. W., 615.
Madsen, H., 635.
Magnusson, H., 587.
Mahajan, M. R., 584.
Maignon, F., 602.
Malbrant, R. See Saleun, G., et al., jt. authors, 584.
Malkani, P. G., 585, *bis.*
Mandoul, R., 595.
—. See also Macheboeuf, M., jt. author, 595.
Mansjoer, M. See Kraneveld, F. C., jt. author, 574.
Marshall, E. K., & Long, P. H., 618.
Marshall, E. K., Jr. See Litchfield, J. T., Jr., et al., jt. authors, 618.
Marx, W. See Sprunt, D. H., et al., jt. authors, 589.
Mason, M. F. See Barcroft, J., et al., jt. authors, 626.
Matheson, R., 648.
Matthews, C. A. See Swett, W. W., et al., jt. authors, 605.
Megyaszai, G., 586.
Menkin, V., 607.
Mettam, R. W. M., 639.
Metzger, H. J., Beaudette, F. R., & Stokes, F. R., 630.
Meunier, P., & Raoul, Y., 614.
Meymandi, M. See Darraspen, E., et al., jt. authors, 606.
Michel-Béchet, R., Puig, R., & Charvet, P., 648.
Milks, H. J., 646.
Mills, C. A. See Colvin, J. W., jt. author, 606.
Mitchell, D. T., 639.
Möller, H. See Keller, H., jt. author, 617.
Monroe, C. F., & Perkins, A. E., 628.
Morgan, D. O., & Wilson, J. E., 596.
Morris, J. P. A., 642.
Moschkowitz, L., & Sprinz, H., 610.
Muratov, E. A., & Aikashev, D. N., 581.
Murray, C., 633.
Myers, G. N., 623.
Myhill, B. A., 605.

Naik, R. N., 575.
Natvig, L. R., 590.
New Zealand, Rep. Dep. sci. industr. Res., 1936–37, 640.
Nigeria, 639.
Norris, L. C., & Bauernfeind, J. C., 613.
Northern Rhodesia, 642, 643.

Ogata, S. See Isshiki, O., jt. author, 597.
Okabe, K., 592.
Okuno, Y. See Tazima, T., et al., jt. authors, 578.
Olafsson, A., 596.
Orszagh, O., & Alfoldy, J., 601.
Outhouse, E. L. See Forbes, J. C., jt. author, 622.
Oxspring, G. E. See McEwen, A. D., jt. author, 580.
Oyama, T. See Tazima, T., et al., jt. authors, 578.

Pabijanskas, A., 603.
Pearson, P. B., Schmidt, H., & Mackey, A. K., 614.
Peatt, E. S. W., 604.
Penderi, G., 625.
Penna, H. A., 630.
Perkins, A. E. See Monroe, C. F., jr. author, 628.
Petersen, G. H., 644.
Pfeffer, A. See Seeleman, M., jt. author, 580.
Picard, F. H. J., & Bakker, T., 613.
Pickering, J. P., 604.
Pierre, 629.
van der Plank, G. M., 612.
Plantureux, E., 588.
Pochon, J., 628.
Poncet, A. See Sergent, Ed., jt. author, 585.
Popescu-Baran, M., 598.
Prickett, C. O., Salmon, W. D., & Schrader, G. A., 615.
—. See also Schrader, G. A., jt. author, 615.
Puig, R. See Michel-Béchet, R., et al., jt. authors, 648.
Pulvertaft, R. J. V., Lemon, G. C., & Walker, J. W., 620.

Radley, J. A., & Grant, J., 647.
Rajagopalan, V. R., 611.
Ramon, G., 600.
Raoul, Y. See Meunier, P., jt. author, 614.
Rasch, K., 616.
Ratomski, A., 578.
Reinié, L. See Levaditi, C., et al., jt. authors, 589.
Renoux, G. See Lisbonne, M., et al., jt. authors, 581.
Rep. Lond. County Coun., 1937, 640, *bis.*
Reuszer, H. W. See Barr, C. G., et al., jt. authors, 624.
Reynolds, F. H. K. See Stone, W. S., jt. author, 585.
Richardson, U. F., 585.
Rider, D. L., 621.
Rimington, C., 627.
Rimpau, W., 579.
Rinjard, P., Gratiolet, G., & Chabot, C., 587.
Robertson, H. E., 608.
Roman, G. See Lisbonne, M., et al., jt. authors, 581.
Romaña, C., 601.
Rosenbusch, F., 587.
Rossi, P., 605, *bis.*
Roth, H., 598.
Roumaillac, P., 624.
le Roux, P. L., 643.
Russell, W. See Chichester, D. F., et al., jt. authors, 613.

Sabin, A. B., 582.
Saifi, M. F. See Vaughan, J. M., jt. author, 607.
Saleun, G., Maibrant, R., & Bayron, M., 584.
Salmon, W. D. See Prickett, C. O., et al., jt. authors, 615.
Sangster, G. A., 640.
Schermer, S., 611.
Schmidt, H. See Pearson, P. B., et al., jt. authors, 614.
Schneider, H., & Steenbock, H., 613.
Schrader, G. A., & Prickett, C. O., 615.
—. See also Prickett, C. O., et al., jt. authors, 615.
Schwarte, L. H., Eveleth, D. F., & Biester, H. E., 623.
Seeleman, M., & Pfeffer, A., 580.
Selbie, F. R., & McIntosh, J., 609.
Sergent, Ed., & Poncet, A., 585.
Shearer, G. D. See Dunlop, G., et al., jt. authors, 612.
Sheppard, M. See MacLean, D. L., et al., jt. authors, 615.
Shorb, D. A., 593.
Silverman, I. J. See Wiener, A. S., jt. author, 602.
Sinev, A. V., 623.
Skinner, C. E., 581.
Smadel, J. E., Lavin, G. I., & Dubos, R. J., 589.
Smith, J. H., 602.
Smith, P. K. See Hoff, H. E., et al., jt. authors, 624.
Smitmans, H., 599.
Somerset (County), 641.
Soni, B. N., 590, *bis.*
Sprinz, H. See Moschkowitz, L., jt. author, 610.
Sprunt, D. H., Marx, W., & Beard, J. W., 589.
Stäter, E. J., 610.
Steenbock, H. See Schneider, H., jt. author, 613.
Stewart, M. A., 621.
Stokes, F. R. See Metzger, H. J., et al., jt. authors, 630.
Stone, W. S., & Reynolds, F. H. K., 585.
Strong, L. C., 621.
Sullivan, E. R. See Dienes, L., jt. author, 582.
Sweden, 645.
Swett, W. W., Matthews, C. A., & Graves, R. R., 605.
Swift, H. F., & Brown, T. M., 582.
Szőke, D., 627.

Tannenbaum, A., 608.
Taylor, E. L., 596, 635.
Tazima, T., Ito, S., Okuno, Y., Oyama, T., & Itabashi, K., 578.
Teorell, T., 627.
Thorp, F., Jr. See Barr, C. G., et al., jt. authors, 624.
Trager, W., 592.
Turner, T. B., & Brayton, N. L., 631.
—, & Fleming, W. L., 631.
Tweed, W., 641.
Twiehaus, M. J. See Bushnell, L. D., et al., jt. authors, 646.

Udall, D. H., 645.
Umboh, T. E. W. See Kraneveld, F. C., jt. author, 619.
Union of South Africa, City of Johannesburg, 638.
United States of America, 645.
Usov, Y. A., 577.

Vacirca, F., 601.
Vaughan, J. M., & Saifi, M. F., 607.
Verstraete, A., 616.
Vet. Rec., 633, 635.
Volkova, A. A., 578.

de Waele, A., 592.
Walker, J. W. See Pulvertaft, R. J. V., et al., jt. authors, 620.
Walsh, F. E. See Eveleth, M. W., et al., jt. authors, 612.
Ward, R. E. See Flora, C. C., et al., jt. authors, 614.
Watkins, C. V., 634.
Weber, H. H., 626.
Weil, P. E., 647.
Weir, J., 640.
Wells, H. E. See Dunlop, G., et al., jt. authors, 612.
Wetzel, R., & Enigk, K., 583, 597.
White, H. J. See Litchfield, J. T., Jr., et al., jt. authors, 618.
Whitelaw, W. See Gaisford, W. F., et al., jt. authors, 618.
Wiener, A. S., & Silverman, I. J., 602.
Wilson, J. E. See Morgan, D. O., jt. author, 596.
Wilts (County), 641, *bis*.
Winkler, A. W. See Hoff, H. E., et al., jt. authors, 624.
Wyckoff, R. W. G. See Beard, J. W., et. al., jt. authors, 589.

Yarrow, T. B. See Downham, K. D., jt. author, 604.

Zaharija, I. See Hupbauer, A., jt. author, 604.
Žibert, S., 576.

Bulletins on disease subjects written for farmers and "popular" articles of a similar nature are not included in the *Veterinary Bulletin*. Those of a sufficiently important nature, are, however, included in *Index Veterinarius*; so also are certain review articles, presidential addresses, congress proceedings, etc., where the title conveys as much information as could be given in an abstract of a few lines. For information of this nature, readers of the *Veterinary Bulletin* are referred to *Index Veterinarius*, where titles of all publications indexed by the bureau are fully cross-referenced.

INDEX VETERINARIUS.

See notice on page 3 of cover.

Printed in Great Britain by H. R. Grubb, Ltd., Croydon.

IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 10.] August, 1940. [No. 8.

DISEASES CAUSED BY BACTERIA AND FUNGI

EDWARDS, S. J. (1938). **The Diagnosis of Streptococcus Mastitis by Cultural Methods.**—*J. comp. Path.* **51.** 250–263. 5 tables. [10 refs.]

After a discussion of the advantages and drawbacks of using ox blood agar with and without aesculin and crystal violet, E. reports experiments made in order to simplify the bacteriological diagnosis of mastitis.

(1) Whole milk, gravity cream and centrifuge deposit were separately prepared from 27 samples of milk and were sown on ox blood agar. Gravity cream gave the largest number of positive results and is therefore to be preferred.

(2) The results of incubating milk samples, to which crystal violet and bromcresol-purple had been added, as well as of making plate cultures on blood agar, indicated that the former method is unreliable as it gives positive results when no growth occurs on the agar plates ; this is due to the growth of contaminants in the milk. Ox blood agar is known to be reliable.

(3) Glucose broth containing 1 p.p.m. of crystal violet and sodium azide (0·0001 %) was found to be a reliable selective culture medium for mastitis streptococci.

This method demands less time and glassware than plating methods and is recommended for the routine examination of the milk of cows which have previously been found free from haemolytic streptococci by a blood agar plate test.

E. finally describes a procedure for laboratory diagnosis of mastitis such as would be suitable for use in a large scale mastitis control scheme, using for composite milk samples in initial herd tests both crystal-violet-aesculin blood agar and the glucose broth [see (3) above] and for quarter samples on the clean section of the herd two months later the glucose broth medium only.—J. E.

JANISCH, R. (1939). A streptococcus mastitis felismerése a vidéki gyakorlatban. **[Clinical Diagnosis of Streptococcal Mastitis].**—*Thesis, Budapest.* pp. 11. [12 refs.] [German summary].

A survey of the rapid tests in use for the diagnosis of this affection and not requiring special training or equipment.—E. MARTIN.

FORSSMAN, J. (1938). **Studies in Staphylococci. XII. A Contribution to the Knowledge of Late Paralyses in Rabbits Following Staphylococcus Infections.**—*Acta path. microbiol. scand.* Suppl. No. 37. pp. 155–162. 1 table. [3 refs.] [In English].

In rabbits which had been immunized against staphylococcal infection, a paralysis developed following the injection of a subsequent fatal dose of culture.

This condition occurred up to several months after the injection, and it is said to have been due to the development of a staphylococcal focus in the body of a vertebra, and its penetration into the spinal cord. An experiment is described which was designed to furnish information on the nature of the immunity in rabbits. A group of six rabbits received several injections of formolized staphylococcus culture and after a period of 94 days received one M.L.D. of pure culture. All the animals survived this injection, but between 30 and 48 days after injection five of them developed paralysis. This experiment demonstrated the fact that the paralysed animals, in spite of the protective power of their sera, were unable to resist completely the organisms given at the test injection. At a period shortly before the onset of paralysis it was found that the serum of one immunized rabbit was able to protect normal rabbits against fatal doses of staphylococci. After the onset of paralysis, however, the protective powers of the serum rapidly waned.
—S. J. Edwards.

Endrejat, E. (1939). Ueber die Lebensfähigkeit von Milzbrandsporen im gereinigten und eingesalzenen Schafdarm. [**Viability of Anthrax Spores in Cleaned and Salted Sheep Gut**].—*Z. Fleisch- u. Milchhyg.* **49.** 409–410. [2 refs.]

The opinion is prevalent in the trade in Iran that either the colour or the texture of the intestines of sheep which have died of anthrax is so characteristic that the organ would never be used for food purposes. It is also believed that if anthrax-infected intestines were used, the spores would be destroyed during pickling. *Bacillus anthracis*, however, was cultivated from such gut after it had been 75 days in brine.—G. Williamson.

Gladstone, G. P. (1939). **Inter-Relationships Between Amino-Acids in the Nutrition of** *B. Anthracis*.—*Brit. J. exp. Path.* **20.** 189–200. 4 tables. [9 refs.]

G. gives details of the chemical composition of the medium used during an investigation into the amino-acid growth requirements of *B. anthracis*, and describes an interrelationship between amino-acids of similar chemical composition in their effect on the growth of the organism. When certain of these amino-acids, *e.g.* valine, leucine, and isoleucine are added singly to the medium, no growth takes place, but when all three are added good growth occurs after a late start. It is thus reasoned that, although each acid is in itself toxic and inhibitory to growth, in association with the others the toxic effect of each is neutralized by the others and growth accordingly stimulated. The experiments were repeated using the natural isomers instead of synthetic preparations and similar results were obtained.

Details are given of the concentration of the various amino-acids concerned and attention is drawn to the possibility of there being some practical application of the results of the investigation in connexion with nutritional studies in animals.
—J. R. Lawson.

Kraneveld, F. C., & Mansjoer, M. (1939). De miltvuurbacil in het digestie apparaat van den Tabanus rubidus Wied. [**Anthrax Bacilli in the Digestive Tube of** *T. rubidus*].—*Ned.-ind. Bl. Diergeneesk.* **51.** 62–75. 3 tables. [17 refs.] [English and German summaries].

Among some *T. rubidus*, which had fed on an animal infected with anthrax, many were found which excreted the anthrax bacilli in their faeces till their death (up to 13 days); the number of bacilli in faeces varied greatly. Anthrax bacilli could be isolated from the proboscides of the flies for a week. This was the case

both with flies which were not allowed to feed again after the infection and with those which were allowed to suck the blood of healthy animals repeatedly. The bacilli did not multiply in the intestinal tract of the flies. Some of the bacilli were digested and some were excreted. Sporulating organisms were present in the proboscis and intestine of flies which had fed once 24 hours previously. In flies which had fed repeatedly, sporulation appeared to be delayed.

—JAC. JANSEN (UTRECHT).

KRANEVELD, F. C., & DJAENOEDIN, R. (1939). De resistentie tegen miltvuur van aan surra lijdende caviae. [**Susceptibility to Anthrax of G. Pigs Affected with Surra**].—*Ned.-ind. Bl. Diergeneesk.* **51.** 292–296. 2 tables. [3 refs.] [English and German summaries]. [Abst. from authors' English summary].

G. pigs infected with *Trypanosoma evansi*, and with parasites present in the peripheral circulation, were as susceptible to anthrax as uninfected g. pigs.

—. (1939). Décret concernant la prophylaxie subventionée de la tuberculose des bovidés. [**Decree concerning State-Aided Control of Bovine Tuberculosis. France**].—*Bull. Off. internat. Epiz.* **17.** 918–920. [1 ref.]

The decree provides for the revocation of certain articles of previous decrees and their replacement by the provision of :– (1) subsidies covering loss resulting from slaughter of tuberculous animals, cost of disinfection of premises and improvement in hygiene of byres, and (2) free tuberculin testing and vaccination.

Procedure for estimating the loss arising from the slaughter of affected animals and their transport and disposal, and for the disinfection of premises is indicated.

Conditions under which subsidies may be granted to associations and federations of owners, co-operating in TB. eradication schemes, are indicated and the obligations of such bodies in arranging and effecting complete annual tuberculin tests of all their cattle, in introducing into their herds only tested cattle, and in furnishing periodical returns of tests and costs to the Central Authority are set forth.

The role of the Veterinary Director in controlling the execution of the scheme and the responsibilities thereunder of the Ministers of Agriculture and Finance are defined.—H. BURROW.

HÜLPHERS, G. (1939). Undersökningar över förekomst av tuberkelbaciller i hönsägg. [**Research On the Presence of Tubercle Bacilli in Hens' Eggs**]. —*Skand. VetTidskr.* **29.** 1213–1226. [16 refs.] [Abst. from author's English summary].

One hundred and sixty-five hens were each inoculated intramuscularly with a mixture of yolk and white of 165 eggs from infected flocks, and kept under observation for three months. Twelve of the hens died without developing lesions. The remainder were killed and none was infected.

H. contributes these results as evidence in conflict with KLIMMER's statement [(1931). *Münch. med. Wschr.* **78.** 1212.] that 10% of eggs from infected hens contain tubercle bacilli.

NAIK, R. N. (1937). **The Diagnosis of Bovine Tuberculosis in India with a Brief Note on the Methods Available for the Disposal of Infected Animals.**— *Proc. Anim. Husb. Res. Wkrs Conf. India, 1936.* pp. 101–108. [Numerous refs.] Discussion pp. 108–109.

N. gave a brief note on the existing knowledge of tuberculosis of cattle in India and of the known methods of control. He gave suggestions for future work.

In the discussion MAHAJAN mentioned 15 positive results in 406 bovines (including buffaloes) tested by the double intradermal method ; three of these reactors were buffaloes. All were confirmed by P.M. examination. WARE stated that although the disease was on the increase in cattle it was not correlated with human TB. SHIRLAW drew attention to the retrogression of lesions at an early stage in Indian cattle. He gave as a possible explanation the effect of sun on skin ergosterin. The comparative absence of tuberculous mastitis in cows of all breeds was commented upon. Several speakers mentioned the existence of the disease in dairy herds kept under good conditions in the open. DIBBEN stated that experience with military dairy herds in India was that no herd was entirely free. HADDOW mentioned that the use of human tuberculin by either the subcutaneous or double intradermal methods gave satisfactory results in cattle, but not in buffaloes. NAIK stated that he had no difficulty in interpreting the results of the double intradermal test in buffaloes.—J. A. GRIFFITHS.

GIRLESTONE, G. R. (1940). **Tuberculosis of Bone and Joint.** pp. xii+265. 161 figs. London : Oxford University Press. [8vo] [30s.]

An account of treatment of the disease in human beings. A few lines are devoted to the role of the bovine type of tubercle bacillus.

BAUMANN, T. (1939). Die Bedeutung des Typus bovinus für die Tuberkulose des Kindesalters. [**The Importance of the Bovine Type of Tubercle Bacilli for Tuberculosis in Children**].—*Schweiz. med. Wschr.* **69.** 233–241. 11 tables. [Numerous refs.] [Extract from abst. in *Tubercle, Lond.* **20.** 484].

The author calculates that if about 8 per cent. of all tuberculin positive children are presumed to be infected with the bovine type of tubercle bacillus, then in Switzerland alone some 16,000 children between the ages of 0 and 14 are thus infected. To judge by the investigations of Mündel and Strempel in Berne, the bovine type plays as important a part in the total incidence of tuberculosis in Switzerland as it has proved to do in Germany, Denmark, and France. One of the author's tables deals with the tuberculosis mortality in Switzerland in the five-year period 1933–37, the different locations of the disease in the body being kept separate. He concludes with an endorsement of Calmette's dictum : " Bovine tuberculosis is a danger for man and a great danger for the child."

ŽIBERT, Š. (1939). Pseudotuberkuloza ali rodencioza pri zajcih. [**Pseudotuberculosis and Tularaemia in Hares (in Yugoslavia)**].—*Jugoslov. vet. Glasn.* **19.** 174–175. [German summary].

During the period 1937–39 at the Veterinary Laboratory, Ljubljana, *Pasteurella pseudotuberculosis* was isolated 18 times, *Past. tularense* four times and a staphylococcus once from hares dead in outbreaks of disease in Slovenia, Yugoslavia. It was impossible to distinguish between pseudotuberculosis and tularaemia by serological methods.—B. OSWALD (NOVI, YUGOSLAVIA).

DILDINE, S. C. (1939). **Glanders in Army Animals.**—*Vet. Bull. U.S. Army.* **33.** 98–104.

The occurrence in China of clinical cases of glanders among American army as well as civilian horses is discussed. The history is traced of reintroduction of the disease into the author's station.—H. BURROW.

I. GRAHAM, R. (1939). **Listerella Encephalitis or Encephalomyelitis in Domestic Animals.**—*J. Amer. vet. med. Ass.* **95.** 289–292. 2 figs. [14 refs.]

II. GRAHAM, R., HESTER, H. R., & LEVINE, N. D. (1939). **Listerella from a Premature Bovine Fetus.**—*Science.* **90.** 336–337. [7 refs.]

I. Listerellosis of ruminants, a specific bacterial infection of the brain and spinal cord, can be diagnosed only by a laboratory examination for histopathological changes in the brain and by the detection of the causative organism. In the absence of such an examination the disease is often mistaken for forage or silage poisoning, alimentary intoxication, haemorrhagic septicaemia, feeding disturbances, acetonaemia, non-specific cerebrospinal meningitis or even rabies. Spontaneous infection occurs also in rabbits, gerbilles, foxes, chickens and human beings, while g. pigs are susceptible to artificial infection. The distribution of the disease throughout the world is reviewed and the symptoms, course and gross lesions in various animals are described. The risk of human infection by contact and ingestion is stressed.

II. The isolation is recorded of a haemolytic Gram-positive rod, possessing the cultural, pathogenic and serological characters of the genus *Listerella*, from the stomach of a seven months, aborted bovine foetus in a brucella-free herd with no definite history of encephalitis. The bacillus killed rabbits and g. pigs by various routes and produced a severe conjunctivitis by ocular instillation. The strain was agglutinated to a titre of 1 : 1,600 by Julianelle's Type I and to a titre of 1 : 25 by his Type II listerella antiserum. Artificial abortion was induced in a healthy, pregnant heifer ten days after intravenous injection with a culture of the listerella strain, which was recovered from the brain, heart blood, bone-marrow and thymus gland of the foetus. Reference is made to listerella infection in infants.—R. O. M.

JACOTOT, H. (1940). Étude sur la sérothérapie préventive et curative de la pasteurellose des boeufs et des buffles. [**Preventive and Curative Serotherapy of Pasteurella Infection in Cattle and Buffaloes**].—*Ann. Inst. Pasteur.* **64.** 55–72. [1 ref.]

The serum is prepared from young cattle which are infected *per os* with a mixture of blood, organs and the local oedema from a calf infected by inoculation with virulent culture and killed *in extremis*. When symptoms appear the animals are injected with antiserum. They are then hyperimmunized by subcutaneous inoculations of 1 c.c., 50 c.c. and 400 c.c. of an emulsion of virulent organisms given at weekly intervals. Two weeks after the last injection the animals are bled from 1–3 times at weekly intervals. The day after the last bleeding they are reinoculated with 400 c.c. of virulent emulsion and bleeding is repeated as before. It was found that 10 c.c. of the antiserum of these animals protected calves for more than a month against an infection which rapidly killed the controls. Of three calves infected after 45 days, one succumbed. 5 c.c. of serum protected rabbits. A number of other experiments on calves and rabbits are described and indicate that protection is afforded in a large number of cases if the serum is given intravenously soon after infection. In doses of 10 c.c. or more, the serum has a protective action when inoculated at the same time as the infective dose. Experiments also showed that the first bleeding after each inoculation yields serum of a higher potency than in subsequent bleedings. As a preventative, doses of 15–30 c.c. for cattle of about 350 kg. body weight and 25–50 c.c. for buffaloes of 500 kg. are recommended. For curative treatment 50–150 c.c. should be given.
—S. J. GILBERT.

USOV, Y. A. (1937). Sroki vyzhivaniya *B. tularense* v trupakh gryzunov pri raznykh temperaturnykh usloviyakh. [**Survival of** *Bacterium tularense* **in**

the Dead Bodies of Rodents at Different Temperatures].—*Rev. Microbiol., Saratov.* **16.** 308–311. 1 table. [6 refs.] [English summary].

U. infected 112 mice with a 48-hour culture of *Bact. tularense.* The bodies were preserved after death at different temperatures, *viz* 40 at –1·2° to –35°C., 14 at a temperature alternating between frost and thaw, 40 at 14°–17°C. and 18 at body heat. In the first group the bacteria retained their virulence for at least 90 days, when the experiment was interrupted by a change in the weather. The conclusion is drawn that the dead bodies of rodents which perish of tularaemia in the autumn may serve as the source of an outbreak in the spring, as *Bact. tularense* survives at low temperatures during a much longer period than was hitherto assumed.—E. MARTIN.

VOLKOVA, A. A. (1938). Kishechnaya palochka kak prichina zabolevaniya yagnyat vo vtoroĭ polovine podsosnovo perioda i posle ot'ema. [*Bacterium coli* **Infection of Lambs**].—*Trud. Uzbek. nauchn.-issled. vet. Stan. Tashkent.* **9.** 48–58. 2 tables. [9 refs.] [English summary].

Eighteen new-born lambs died on a farm after illness lasting 20 minutes to three hours after the appearance of the first symptoms (trembling, stumbling, high temperature, but no diarrhoea). In each case the bacteriological examination gave cultures of *Bact. coli* virulent both for laboratory animals and for a lamb when given intravenously.

The lambs were weak and V. considered that this permitted the *Bact. coli* infection to develop. She suggested that such weak lambs should be isolated in order that they may not spread infection.—E. MARTIN.

RATOMSKI, A. (1938). Antagonizm pałeczek okrężnicy i laseczek wąglika. [**Antagonism Between** *Bacterium coli* **and** *Bacillus anthracis*].—*Przegl. wet.* **53.** 488-528. 3 figs. [Numerous refs.] [German summary].

Growth of *B.a.* is inhibited by *Pseudomonas pyocyanea,* and to a lesser extent by *B. subtilis, Bact. coli* and *Salmonella paratyphi B.* Only living organisms have this effect, and the substance or substances responsible could not be isolated. After observation of such mixed cultures it is sometimes possible to demonstrate anthrax bacilli as some of the anthrax strains outlive the antagonistic organisms.

A prolonged observation is also necessary in animal inoculation experiments, since the antagonistic organisms incorporated may retard the development of the infection. Negative results of peroral infection with anthrax bacilli are probably due to stomach flora. [According to HRUŠKA (*V. B.* **9.** 816.) anthrax infection is invariably dependent on lesions of the skin or mucous membrane].
—V. CHLÁDEK (PRAGUE).

TAZIMA, T., ITO, S., OKUNO, Y., OYAMA, T., & ITABASHI, K. (1939). **Studies on Contagious Abortion in Sheep. IV. Excretion of** *Brucella melitensis* **from Naturally Infected Ewes after Abortion.**—*Jap. J. vet. Sci.* **1.** 525–538 12 tables. [17 refs.] [In Japanese : abst. from English summary].

The authors attempted to isolate *Br. melitensis* organisms from the blood, urine, faeces, milk and vaginal discharge of 28 naturally infected ewes after their normal parturition. In 1937 nineteen of these ewes had aborted as a result of *Br. melitensis* infection, and nine which gave positive serological reactions had never lambed.

The results are recorded in tabular form ; ewes which had aborted tended to become carriers of *Br. melitensis* and even if parturition was normal in the following year the organism could be excreted in the uterine exudate.—F. T. BOYLE.

JANSEN, J., & VAN HASELEN, W. H. (1939). Over salmonella-agglutinaties bij woerden en eenden tijdens de ontwikkeling van kuiken tot volwassen dier. [**Salmonella Agglutinins in Ducks and Drakes from Hatching to Maturity**]. —*Tijdschr. Diergeneesk.* **66.** 439–446. 1 table. [English, French and German summaries].

Observations were made on ducks and drakes on a farm which was infected with *Salmonella enteritidis* var. *essen.* Fifty 5-day-old ducks were placed in one run with the water supply outside and 49 five-day-old drakes were placed in another with the water supply inside. Agglutination tests were made on all of the birds periodically, but no reactions were obtained in either group before the birds were mature, although during this period five ducks and six drakes died of the specific infection. After maturity, positive reactions were obtained in the ducks and in a smaller number of the drakes, possibly an indication that ducks are more susceptible to infection than drakes ; the drakes were presumably more exposed to infection because of their inside water supply.

In large-scale blood testing 12% of 4,190 drakes gave positive reactions as against 35% of 23,157 ducks.—JAC. JANSEN (UTRECHT).

I. KREMSREITER, J. (1937). Menschenpathogene hämoglobinophile Bakterien in den Luftwegen einer gesunden Katze. [**Haemoglobinophilic Bacteria, Pathogenic for Man, in the Respiratory Passages of a Healthy Cat**].—*Arch. Hyg., Berl.* **118.** 97–110. [Numerous refs.]

II. RIMPAU, W. (1937). Ueber Infektionen des Menschen durch Haus- und Stalltiere. [**Infections of Human Beings from Domestic Animals : Infection with Haemoglobinophilic Bacteria from a Cat**].—*Münch. med. Wschr.* **84.** 413–414.

I. A man sustained severe inflammation of an arm after being bitten on the hand by a healthy cat. A very small Gram-negative bacillus was isolated from the wound and from the respiratory tract of the cat. The organism was non-motile, uncapsulated and did not form spores ; it grew well on blood agar and fermented glucose, galactose and saccharose readily, marmite and laevulose weakly and lactose not at all. It was pathogenic for g. pigs and mice.

The identity of the organism is discussed : it is different from the influenza bacillus but has some similarity to an organism isolated from a cat by RIVERS and BAYNE-JONES [(1923). *J. exp. Med.* **37.** 131.] and to the ferret influenza bacillus of KAIRIES [*V. B.* **6.** 80].

II. This is a short account of the case described by Kremsreiter.—J. E.

KAIRIES, A., & KOCH, J. (1938). Die Erzeugung von Nebenhöhlenentzündungen bei Katzen mit spezieseigenen Bakterien aus der Gruppe der influenza-bakterienähnlichen Pasteurellen. [**The Production of Head Sinus Inflammation in Cats with a Pasteurella resembling the Influenza Bacillus**].—*Arch. Hyg., Berl.* **120.** 180–191. 5 tables. [Numerous refs.]

An attempt was made to cause inflammation of the frontal sinuses in young cats by injecting directly into these sinuses suspensions of *Staphylococcus aureus, Streptococcus haemolyticus* and a pasteurella resembling the influenza bacillus respectively ; the last-named was isolated from the respiratory tract of cats, being considered to be a saprophyte. All these tests gave negative results. The experiments were repeated with the difference that the naso-frontal ducts in the experimental cats were first occluded by the injection into them of a few drops of 25% lactic acid which caused an inflammatory oedema. Sinus inflammation was set up in some of the animals by the pasteurella organism.

The cultural characters of this organism are described. It differed from the organism described by RIVERS and BAYNE-JONES [(1923). *J. exp. Med.* **37.** 131.], but resembled the one described by RIMPAU and by KREMSREITER [see preceding abstract].

An immune serum prepared against the cat bacteria was active against the organism and also against certain strains of pasteurella isolated from ferrets.

The cat pasteurella killed mice and rabbits. Serum prepared against the pasteurella was reciprocally active against classical pasteurella.

—SASSENHOFF (MUNICH).

SEELEMAN, M., & PFEFFER, A. (1939). Ueber blutserologische Befunde von Kälbern und Jungrindern aus bangverseuchten Beständen. [**Serological Blood tests on Calves and Young Cattle in Herds Infected with Brucellosis**]. —*Tierärztl. Rdsch.* **45.** 671–675. 4 tables. [7 refs.]

The authors tested the blood of calves on ten farms by a combination of rapid agglutination, tube agglutination, and the Sachweh and Meinicke flocculation reactions; 568 animals of ages varying from 1–28 months were so tested, and of these only 29 could be regarded as positive and 21 as doubtful. In general, no difference could be detected between calves from positive reactor dams and those whose dams were serologically negative. Practically no positives occurred amongst very young calves, even although *Br. abortus* infected milk was being fed and the calves were standing in infected stalls. At about 18 months susceptibility appeared to increase. One case, that of a calf from a positive reactor dam whose milk was infected, was followed from birth to 15 months. The mother showed an agglutination blood titre of 3,200 and a milk titre of from 160–320. Agglutination titres in the calf rose gradually from 10 to 80 at weaning, to 160 soon after, and then declined rapidly to 20 and then to 5. Flocculation reactions remained positive throughout until about the 8th month, when the Meinicke reaction became negative. The Sachweh reaction persisted until the 12th month and then became negative.—H. E. HARBOUR.

MCEWEN, A. D., & OXSPRING, G. E. (1940). **The Treatment of *Br. abortus*-Infected Cattle with "Abortulin".**—*Vet. Rec.* **52.** 107–108. 1 table.

Tests were made on two cows known to be excreting *Br. abortus* in their milk. "Abortulin" [a proprietary remedy of undisclosed composition] was inoculated intravenously in the manner indicated by the makers. In the first animal the milk showed infection similar to that which occurred before treatment, up to a period of 20 days after treatment, from which time the cow was dried off. Cultivation of the milk of the second cow was carried out at weekly intervals after treatment for a period of nine weeks, and showed no diminution in the numbers of *Br. abortus* excreted as compared with examinations made on nine occasions before treatment.

—S. J. GILBERT.

MCEWEN, A. D. (1940). **The Virulence of *Br. abortus* for Laboratory Animals and Pregnant Cattle.**—*Vet. Rec.* **52.** 97–106. 11 tables. [8 refs.]

Four recently isolated field strains and one rough and four smooth strains which had been sub-cultivated for long periods were examined for infectivity, g. pigs being inoculated intramuscularly or *via* the conjunctiva, using a diminishing dosage. Two groups of cattle were also used in the tests. Toxicity tests were performed by intraperitoneal inoculation of mice. High infectivity and a high degree of toxicity are regarded as evidence of virulence and the converse as evidence of low virulence. Field strains of *Br. abortus* have a common level of virulence

that may be shared by strains kept in the laboratory for several years and repeatedly sub-cultured. A marked reduction of virulence for g. pigs and mice is accompanied by a great reduction of virulence for pregnant cattle, but pregnant cattle inoculated subcutaneously with strains of very low infectivity for g. pigs and of low toxicity for mice may become infected in the uterus and in the udder, and the strains on recovery from these animals may be fully virulent. A strain of *Br.a.* may be so reduced in virulence that it is unable to cause infection of the uterus or of the udder when inoculated into pregnant cattle, but such a strain may become enhanced in virulence by suitable animal passage until it is as virulent as field strains.

The results of the experiments are shown in a series of tables and these are fully discussed in the paper which should be consulted for details.—S. J. GILBERT.

MURATOV, E. A., & AÏKASHEV, D. N. (1935). Brutsellez ovets v Turkmenii. [**Ovine Brucellosis in Turkmenia**].—*Bull. Uzbek. nauchn.-issled. vet. Inst., Tashkent.* No. 1–2. pp. 44–46. 2 tables.

A record of the occurrence of brucellosis among human beings, sheep and goats in Turkmenia.—E. MARTIN.

LAMONT, H. G. (1939). **Investigation by the Veterinary Research Division, Ministry of Agriculture—1938-39 [Anti-Abortion Vaccination Experiment on Calves]**.—*Rep. agric. Res. Inst. N. Ire. 1938-39.* p. 37.

A few lines concerning a small scale calf vaccination experiment which is in progress.—J. E.

LISBONNE, M., ROMAN, G., & RENOUX, G. (1939). Les vaccins en excipient gras ne vaccinent pas le cobaye contre l'infection brucellique. [**Immunizing Power of Vaccines in Fatty Excipients against Brucella Infection**].—*C. R. Soc. Biol. Paris.* **132.** 381–384. [2 refs.]

A commercial vaccine consisting of the porcine strain of *Br. abortus* incorporated in lanolin and paraffin was selected for these experiments. The freshly prepared vaccine was found, by HUDDLESON's technique, to contain living porcine type brucella. Twelve g. pigs were each inoculated with 0·25 c.c. of the vaccine and nine with 0·5 c.c. each. After five weeks a slightly positive result was obtained to the agglutination test, and the g. pigs and ten controls were then each infected with two million *Br. melitensis* by scarification. The animals were killed 3½ months after the commencement of the experiment. The vaccinated g. pigs showed an encapsulated abscess at the point of inoculation which yielded cultures of the porcine strain of *Br. abortus.* The organs and those of the controls yielded cultures of *Br. melitensis* only.—S. J. GILBERT.

SKINNER, C. E. (1938). **The " Tyrosinase Reaction " of the Actinomycetes.**—*J. Bact.* **35.** 415-424. [Numerous refs.]

S. isolated from soil 80 strains of actinomycetes, which gave dark brown to black pigment on beef-peptone agar. Similar pigment formation occurred on 15% Difco gelatin, but the latter gave a positive Millon test for tyrosine. This finding explains anomalous results of other workers who have doubted the tyrosine metabolism by chromogenic strains of actinomycetes. When CONN's (1921) agar medium, which is white rather than yellow like the beef peptone agar, was used, the addition of 0·001% tyrosine produced a black pigment rather than the dark brown pigment noticed in beef-peptone agar. If no tyrosine was added to Conn's medium when adjusted to pH 6·8 and 8·5, some of the strains produced blue, violet, yellow, orange or brown pigments in seven days. S. suggests that previous

workers probably obtained conflicting results through noting colour changes of actinomycetes on amino-acids other than tyrosine. He discusses the complicated chemical " tyrosinase reaction " (BODANSKY, 1930) and its bacteriological application.—C. V. WATKINS.

I. KLIENEBERGER, Emmy. (1939). **Studies of Pleuropneumonia-Like Organisms: Bacteriological Features and Serological Relationships of Strains from Various Sources.**—*J. Path. Bact.* **49.** 451–452. [13 refs.]

II. DIENES, L., & SULLIVAN, E. R. (1939). **Morphology and Nature of Pleuropneumonia-Like Microorganisms.**—*Proc. Soc. exp. Biol., N.Y.* **41.** 424–426. 1 fig. [7 refs.]

III. SWIFT, H. F., & BROWN, T. M. (1939). **Pathogenic Pleuropneumonia-Like Microorganisms from Acute Rheumatic Exudates and Tissues.**—*Science.* **89.** 271–272. [7 refs.]

IV. SABIN, A. B. (1939). **Mice as Carriers of Pathogenic Pleuropneumonia-Like Microorganisms.**—*Ibid.* **90.** 18–19. [6 refs.]

I. A pleuropneumonia-like organism, L1, was isolated in symbiosis with *Streptobacillus moniliformis* from sick g. pigs and rats and in symbiosis with a Gram-positive coccus from a pig. A review is given of the discovery of five independent organisms of the pleuro-pneumonia group: L3, from pulmonary lesions and L4, from abscesses and arthritis, in rats; L5, from " rolling disease " in mice; L6, from the brains of mice injected intracerebrally with the blood of splenectomized mice, and finally a strain causing arthritis in mice. K. preferred serological to morphological and cultural differentiation of these organisms.

II. The morphology of five strains of " pleuropneumonia-like " micro-organisms isolated from the lungs of rats and mice was found to be essentially bacterial. Developing colonies on agar were stained directly by alkaline methylene or toluidin blue. The colonies of the rat strain were very small (10–20μ) and consisted of deeply stained pleomorphic granules which developed into fairly large, round or oval bodies after incubation for 24–48 hours. Young colonies of the mouse strains were composed of fine, curved, granular filaments which became transformed to large, round granular bodies after 48 hours. After the colony had increased in size to about 1 mm., the elements resembled regular bacterial forms, but did not revert to typical bacterial morphology as in the case of KLIENEBERGER'S L1 strains [see I], which the authors consider to be but variants of their so-called symbiont, *Str. moniliformis.*

III. Acute rheumatic fever exudates caused a characteristic lesion of the chorio-allantois of hens' eggs, and mice inoculated intranasally with the original exudate or with egg membrane lesion material developed pneumonia, which was found to be transmissible in series by lung tissue filtrate. A pleuropneumonia-like organism was grown from the above mouse lung tissue as well as from the egg membrane lesions and from original rheumatic fever exudate. Further work is expected to throw light on the cause of rheumatic fever and link up the knowledge on these pleuropneumonia-like organisms.

IV. Two strains of micro-organisms belonging to the pleuro-pneumonia group were isolated from mouse brains. Strain A multiplied in the brain and the serous mesothelia, causing a mild polyarthritis, and produced an exotoxin which gave rise to choreiform symptoms. This strain was also found to be a normal inhabitant of the conjunctiva and nasal mucosa in mice and to be identical with two neurotoxic strains isolated by DIENES [see II] from pneumonia in mice. Strain B caused a chronic, progressive arthritis with ankylosis in mice, but produced no exotoxin. Both strains were immunologically distinct from each other and from bovine and rat strains of the same group. One of three strains, isolated by

SWIFT and BROWN from pneumonia in mice, corresponded with strain A, and one with strain B, while the third was immunologically distinct from both and caused arthritis in mice.—R. O. MUIR.

HENRICI, A. T. (1939). **Experimental Trichophytid in Guinea Pigs.**—*Proc. Soc. exp. Biol., N.Y.* **41.** 349–353. 2 figs. [1 ref.]

Thirty-two g. pigs were infected by scarification with a human strain of *Trichophyton mentagrophytes* of probable equine origin ; 10–52 days after infection 22 of the g. pigs were inoculated intraperitoneally, and also in a few cases by the subcutaneous and intradermal routes, with live spores from ½–1 agar slope culture, 4 with 5 c.c. of mycelial sap, and 6 with 2–50 mg. of crude polysaccharide extracted from the mycelium. All the g. pigs showed some degree of reaction, but those reinoculated 25–30 days after infection, when the primary lesion had almost healed, showed within 24 hours a general erythema (trichophytid) on the ventral surface of the body, on the paws, ears, scrotum, nose and lips, followed by desquamation in another 24 hours. Six g. pigs which had been injected intraperitoneally with live spores showed no skin reaction upon similar reinoculation in 3–4 weeks. Microscopic, histological and cultural examination of the allergic lesion for the presence of fungi was negative. H. concludes that trichophytid is an allergic dermal reaction to soluble fungal products distributed to the skin by the blood. —R. O. MUIR.

DISEASES CAUSED BY PROTOZOAN PARASITES

WETZEL, R., & ENIGK, K. (1938). Zur Aetiologie der Blinddarm-Leberentzündung der Hühnervögel [Blackhead]. [**Aetiology of Blackhead**].—*Rep. 13th int. vet. Congr. 1938.* **2.** 856–862. [9 refs.] [In German : English, French and Italian summaries].

The authors claim that a blastomycete, *Mycotorula albicans*, a widespread intestinal parasite, is the cause of blackhead. E. has previously [*V. B.* **6.** 533.] described the organism as the cause of the disease. They suggest that the various interpretations of the microscopic picture seen in blackhead are explained by the great variation of the parasite in the tissues.

It is stated that there are many resemblances between this fungus and the forms of *Histomonas meleagridis*. The authors refer to TYZZER's claim that he reproduced blackhead by rectal injection with *H.m.*, and state that in some cases there was only a colonization of the flagellate, and that the typical disease was not set up. They also say that Tyzzer's attempts to set up infection *per os* were unsuccessful [but see also *V. B.* **5.** 341.], and that *H.m.* has only been cultured on one occasion from liver lesions in cases of blackhead.

They claim that they, on the other hand, have been able to infect both turkeys and chicks *per os* with *M. albicans* in a fair proportion of cases and that they have cultivated the fungus from the typical liver lesions produced. They were able to reproduce the disease in the absence of *Heterakis*.

They suggest that unfavourable influences such as cold, worms, faulty feeding or vitamin A deficiency may be predisposing causes of the disease.—H. E. H.

DOWNHAM, K. D. (1940). **Investigations into the Control of Blackhead in Turkeys.**—*Vet. Rec.* **52.** 120-122. 3 tables.

An account is given of the treatment of blackhead in turkeys with intravenous or intramuscular arsphenamine diglucoside. The amount of the dose expressed as c.c.'s is calculated by multiplying the age in weeks by 0·1. Successful results

have followed administration provided that the disease was not too advanced. The consolidation of such results is possible, however, only if the birds are removed at once to clean ground. Old ground may sometimes be used if it is not heavily stocked, but in such cases the birds must be reinjected every nine days.

Preliminary observations indicate that resistance to blackhead may be increased by suitable feeding and improved management. In this connexion the feeding of chopped onions to young turkeys appears to be a deterrent to parasitic infestation, and therefore, in practice a valuable routine.—D. D. OGILVIE.

MAHAJAN, M. R. (1939). **Surra in Hyderabad State.**—*Indian J. vet. Sci.* **9.** 217–221. 2 figs. on 1 plate, 1 map. [11 refs.]

Prior to 1932, surra had occurred extensively in horses in Hyderabad State, but rarely in camels. For treatment of equines 10% naganol (intraven.)—50 c.c. per 100 lb. body weight—is used. Of 28 cases treated 21 completely recovered.

Surra in bovines is chiefly observed in bullocks and acute outbreaks may occur. Experimental transmission to various animals showed the trypanosome to be indistinguishable from *T. evansi*. Treatment with naganol has proved effective in the initial stages of the disease in cattle, but not when the illness is severe. In these cases tartar emetic given intravenously has been successful, but it is toxic if injected in the initial stages. *T. theileri* has been observed in the blood of a calf. Two out of 14 camels showed evidence of surra in outbreaks involving equines and camels.—S. J. GILBERT.

SALEUN, G., MALBRANT, R., & BAYRON, M. (1940). Trypanosome du groupe *evansi* observé sur un cheval à Brazzaville. [**A Trypanosome of the** *evansi* **Group in a Horse in Brazzaville (Congo)**].—*Bull. Soc. Path. exot.* **33.** 18–21.

A horse moved from Lake Chad to Brazzaville was found to be infected with a monomorphic trypanosome resembling *Tryp. evansi*. As the animal was emaciated and anaemic, and showed few trypanosomes in the peripheral blood, it was judged that infection had probably occurred before movement. It is pointed out that in Africa trypanosomes of the *evansi* type have been confined to the north. The horse was treated with tartar emetic and atoxyl and made an apparent recovery.
—U. F. RICHARDSON.

CULBERTSON, J. T. (1940). **The Natural Transmission of Immunity against** *Trypanosoma duttoni* **from Mother Mice to their Young.**—*J. Immunol.* **38.** 51–66. 6 tables. [14 refs.]

The results of a series of experiments indicate that, as was described for rats in previous papers [*V. B.* **9.** 836, and **10.** 167.], mice, born after the mother's recovery from *T. duttoni* infection, acquire a definite resistance to this parasite. The immunity is specific and depends upon transference of protective substances in the milk; even mice born of normal dams acquire a resistance when nursed by specifically immune adults. Although the mouse has a deciduate placenta, very slight and transient resistance passes *via* the organ. Antibodies are carried in milk later secreted as well as in the colostrum, and nurslings up to 15 days of age as well as new-born mice can absorb these antibodies from immune dams. Immunity is transferable to the young of a mother passively immunized and of one infected after delivery.—M. L. BINGHAM.

KOLODNY, M. H. (1939). **Seasonal Variations in the Intensity of Experimental Infection with** *Trypanosoma cruzi* **in Young Rats.**—*Amer. J. Hyg.* Sect. C. **29.** 131–133. 1 table. [6 refs.]

Young albino rats in New York infected with *Tryp. cruzi* between October and

May develop a swarming infection of the peripheral blood and almost always die, whilst in similar animals infected between July and August the blood infestation never reaches the same degree of intensity, and about 80 % of the animals recover.
—U. F. RICHARDSON.

STONE, W. S., & REYNOLDS, F. H. K. (1939). **A Practical Method of Obtaining Bacteria-Free Cultures of** *Trichomonas hominis*.—*Science*. **90.** 91–92. 1 fig.

The basis of this method depends upon the influence of the force of gravity on the migration of motile protozoa. Thus, a suspension of protozoa and bacteria is inoculated into a special tube containing a sterile fluid medium, and incubated in the vertical position. The tube is drawn out into a fine capillary having a series of bends or traps. The bacteria get held up at the first or second trap, but the protozoa migrate down the tube and can be isolated by cutting off the distal end and inoculating the contents into the selected medium.—M. L. BINGHAM.

RICHARDSON, U. F. (1939). **The Incidence of Coccidiosis of Sheep in Scotland.**—*Vet. J.* **95.** 349-351. [7 refs.]

R. found that the faeces of five out of six sheep examined at random at the Edinburgh abattoir contained coccidial oocysts. Later, sheep from four farms, two at Edinburgh, one at Kelso and one at Lockerbie were all found infected. Following reports of death of sheep from coccidiosis, a group of lambs was examined at weekly intervals from birth up to 4½ months of age. Oocysts of *Eimeria parva* were present at the age of four weeks. At five weeks, *E. nina-kohl-yakimovi* predominated and forms resembling *E. arloingi* were also present. At seven weeks *E. arloingi* predominated. At eight weeks an *E. faurei* type and also the large form, *E. intricata*, were noted, but these were always few in number. In adult sheep, oocysts of *E. arloingi* predominated and a few of *E. intricata* were usually present. R. gives a brief description of all these species. No appreciable loss in condition resulted in any of the lambs. A similar investigation of pigs revealed mixed infection by *E. debliecki* and *Isospora suis* in 60 % examined without symptoms of disease being noted. Although coccidia are so prevalent in Scotland, R. considers the pathogenicity in both sheep and pigs to be doubtful.—C. V. WATKINS.

SERGENT, Ed., & PONCET, A. (1939). Spirochète sanguicole du dromadaire *Spirochaeta dromadis* nov. sp. [*Sp. dromadis* **n. sp. from the Dromedary**].—*Arch. Inst. Pasteur Algér.* **17.** 509–511. 2 figs. [3 refs.]

The authors state that the intra- and extra-corpuscular parasites, described by LINGARD in 1907 as spirochaetes, in the blood of an Indian camel, were not actually spirochaetes, but derived from the corpuscular elements. They repeat the description of *S. dromadis* already given by one of them [*V. B.* **9.** 156.], the dimensions in the previous note having been slightly modified.—M. L. BINGHAM.

DISEASES CAUSED BY VIRUSES

I. MALKANI, P. G. (1939). **The Effect of Trypanblue on Goat Blood [Rinderpest] Virus.**—*Indian J. vet. Sci.* **9.** 17–30. 7 figs. [7 refs.]

II. MALKANI, P. G. (1939). **The Viability of Rinderpest Goat Blood Virus at Incubator Temperatures.**—*Ibid.* 39–47. 4 figs., 3 tables. [3 refs.]

I. Trypanblue to concentrations of 0·05 % and 0·5 % was added to rinderpest-infected goat blood. The viability of the virus was little affected by the former concentration, but it was reduced by the latter.

II. The work was undertaken to ascertain the viability of the virus *in vitro* at temperatures at which it multiplies and is maintained for long periods *in vivo*. Citrated goat blood virus held at 37°C. in sealed ampoules remained virulent up to six days, but when mixed with Voges Proskauer's solution and kept at 39°C. virulence was maintained to the 15th day; in the same solution and at the same temperature defibrinated blood was viable up to the 13th day.

The results support MINETT's suggestion [(1923). *J. comp. Path.* **36.** 205.] that the claim made by BOYNTON in 1914 to having cultivated the virus was due to a survival of the virus and not to its multiplication.—G. W. WILLIAMSON.

—. (1939). Rapport sur l'enquête concernant les résultats donnés par la méthode Desliens dans la prophylaxie de la fièvre aphteuse. [**Report of an Enquiry into the Use of the Desliens Method for the Prevention of Foot and Mouth Disease**].—*Bull. Soc. vét. prat. Fr.* **23.** 15–26.

A questionnaire about transfusion therapy with convalescent citrated blood against F. & M. disease was sent to 23 practitioners of whom 19 replied. This report summarizes the replies. The treatment was used during the severe outbreak of 1937–38 when 2–15% of adult cattle and 20–50% of calves in badly affected herds in France died. Some 8,863 cattle on infected premises and 2,065 on unaffected premises were treated by indirect transfusion by these practitioners. Dosage varied from 400–750 g. for adults and 60–200 g. for calves and is stated to be half that required when the subcutaneous route is used. There were 11 fatalities. Cross agglutination of donor's blood and recipient's serum may be the cause of transfusion shock. Provided that the transfusion was undertaken early, all claimed that it gave excellent results. When compared with subcutaneous injection, a gain of at least 24 hours in the development of immunity was noted. Testing of the donor's and recipient's blood, in order to ascertain whether haemagglutination phenomena are likely to be important, would eliminate the danger to the recipient. [In practice, such a measure would usually be considered too costly to be practicable.]—C. V. WATKINS.

KINDYAKOV, V. I. (1939). Ustoĭchivost' yashchurnogo virusa na pastbishche. [**Viability of the Virus of Foot and Mouth Disease on Pastures**].—*Sovyet. Vet.* No. 1. pp. 30–31.

At the F. & M. disease laboratory of the Veterinary Research Institute at Kazan (on the Middle Volga), shreds of epithelium from vesicles in g. pigs infected with the O type virus were placed on the stalks of grasses at various distances from the ground and directly on the ground and their virulence was tested at intervals. The material on the grass retained its virulence for one day in summer, for 3–10 days in autumn and, he states, indefinitely in winter. Material on the ground was still infective after 5–7 days in August, after 11–15 days in September and after 15–20 days in October. K. suggests that further experiments should be carried out with other types of F. & M. virus.—E. MARTIN.

MEGYASZAI, G. (1938). Aktiv és passziv immunizálás a száj- és körömfájás ellen. [**Active and Passive Immunization against Foot and Mouth Disease**].—*Állatorv. Közl.* **35.** 4–7.

A survey of the methods used in the inoculation of animals for F. & M. disease.

M. states that the Riems vaccine failed to arrest the spread of the disease in Silesia in September, 1937, when 24,500 head of healthy cattle were inoculated with this preparation without any perceptible effect [but see also *V. B.* **9.** 83].

As the high price of the Riems vaccine is in any case prohibitive in Hungary,

M. advocates the use of local convalescent serum or defibrinated blood for protection, especially of unweaned calves, in the event of a new outbreak of the disease. He stresses, however, that owners and veterinarians should be warned that such protection is by no means absolute and that they should do their utmost to prevent the introduction of the disease rather than rely on vaccination.—E. MARTIN.

MAGNUSSON, H. (1939). Fall av mul- och klövsjuka hos människa. [**Cases of Foot and Mouth Disease in Man**].—*Skand. VetTidskr.* **29.** 152–180. 3 figs., 9 tables. [16 refs.] [English summary]. [Also appeared in *Berl. Munch. tierärztl. Wschr.* July 7th. 421 and July 14th. 437].

A detailed account with case histories of 11 authentic cases of F. & M. disease in farm workers in Sweden. Four were diagnosed by g. pig inoculation, four by the complement-fixation test and three on clinical and epidemological grounds.

In all cases, primary vesicles developed on the hands. In two cases attempts to transmit the disease to three separate persons by scarification failed; this is regarded as evidence of the low susceptibility of human beings to F. & M. disease.

In all the cases tested the virus was Vallée's Type O, the same as in the outbreak in cattle in the districts concerned.—J. E.

FLAUM, A. (1939). **Foot-and-Mouth Disease in Man.**—*Acta path. microbiol. scand.* **16.** 197–213. 5 figs., 2 tables. [Numerous refs.] [In English].

It has long been considered that F. & M. disease may affect man, even at times causing epidemics, but a search of the literature only reveals 16 authenticated cases, eight of which were recorded recently by MAGNUSSON [see previous abstract].

Four cases are described in this article, in three of which the patients had direct contact with diseased animals, and in the fourth handled infected milk; all these cases were confirmed by animal experiments. The course of the disease resembled that in cattle: there was a short incubation period and then a primary lesion followed by generalization. In three cases there was a febrile reaction during generalization, but the subsequent course was apyretic. In one case there were vesicles in the mouth with severe pain, followed by vesicles on the hands and feet. In the other cases there were painful vesicles on the hands and feet which were usually surrounded by a reddened area of skin. During the recent epidemic of F. & M. disease in Europe tens of thousands of people must have come into direct contact with the disease, but very few cases occurred in human beings. Thousands of doses of cow-pox vaccine infected with virulent F. & M. virus have been inadvertently inoculated into man without a single case developing. It is, therefore, concluded that F. & M. disease does not constitute a medical problem.—J. F.

RINJARD, P., GRATIOLET, G., & CHABOT, C. (1939). Au sujet du contrôle d'un cas de transmission de la fièvre aphteuse de l'animal à l'homme. [**Transmission of Foot and Mouth Disease from Animals to Man**].—*Bull. Acad. vét. Fr.* **12.** 325-338. 1 table, 1 graph. [Numerous refs.]

The authors review the sparse records of proved transmission of F. & M. disease from animals to man and detail a further case in a Frenchwoman who worked with a herd of infected dairy cattle. Vesicles developed on the palms of her hands and on the soles of her feet. Epithelium from the plantar lesions was passaged through a cow with positive results and was typed in g. pigs as being of the O Type.—C. V. WATKINS.

ROSENBUSCH, F. (1938). La peste porcina. [**Swine Fever**].—*Bol. mens. Direcc. Ganad., Montevideo.* **22.** 256–272.

This is a general review of the subject with particular attention to prophylaxis

as practised in the U.S.A., Europe and Uruguay. R. deplores the spread of the disease in Uruguay and attributes this to the use by laymen of the simultaneous serum-virus method of immunization. It is stated that immunization is often improperly carried out. Serum of low quality which even contains contaminating bacteria is used. It is suggested that control should be by slaughter of infected pigs, isolation of in-contacts, administration of serum alone and prohibition of movement. It is emphasized that the simultaneous method of immunization should be carried out only by veterinarians.—J. PASFIELD.

I. BALOZET, L. (1938). La rage dans les contrées tropicales et sub-tropicales et sa prophylaxie. La vaccination préventive des chiens. [**Preventive Vaccination of Dogs against Rabies in Tropical and Sub-Tropical Countries**]. —*Acta Conv. tert. trop. malar. Morbis, 1938.* Pt. 1. pp. 590–600. Amsterdam : Societas Neerlandica Medicinae Tropicae. [In French : Discussion pp. 600–601 in English].

II. PLANTUREUX, E. (1938). Sur la vaccination antirabique préventive des chiens en Algérie par le vaccin formolé. [**Preventive Vaccination of Dogs against Rabies in Algeria with Formolized Vaccine**].—*Ibid.* pp. 613–615. Amsterdam : Societas Neerlandica Medicinae Tropicae. [In French].

I. This is an instructive review on rabies as it occurs in the tropics and the sub-tropics, with special reference to animal vectors, types of virus, control and vaccination, oulou-fato and South American rabies in cattle.

Phenolized and glycerin-phenolized dead vaccines have been most widely used for pre-infectional immunization. The degree of immunity conferred varies directly with the dose of brain tissue and with the number of inoculations. In Tunis, B. uses for dogs two doses each of 40 c.c. of etherized brain, triturated and left in a 1 : 1,500 formalin saline solution for 24 hours before use. The choice of fixed virus for vaccine production is important and must be based on experience with the particular strains available. Post-infectional vaccination of herbivora gives good results.

II. Prophylactic vaccination of dogs was begun in Algeria in 1930, a formolized (5 : 1,000) dog-brain, fixed virus being used, two initial doses being followed by a single dose at the end of each year. Curative vaccination of vaccinated dogs which get bitten by a rabid animal is permitted if it is carried out within seven days, otherwise they are killed, as are non-vaccinated dogs which become infected. As the original Algiers fixed virus used to cause paralytic accidents, the Tangier strain was substituted, and no more trouble ensued ; 26,000 dogs have been vaccinated in Algeria and only two of them have died later of rabies.

It has been possible to rid one commune of rabies in six years by free vaccination of all dogs, and it is proposed to extend this service to three more communes.

In the discussion ANDREWS related experience with a South American rabies virus and described a case of rabies occurring in a dog over seven months after leaving a country where the disease occurs.—J. E.

DUKALOV, I. A. (1935). K voprosu antirabicheskikh privivok u domashnikh zhivotnykh. [**Antirabic Inoculation of Domestic Animals**].—*Bull. Uzbek. nauchn.-issled. vet. Inst., Tashkent.* No. 1-2. pp. 62–63.

This is a general description of the routine treatment of animals bitten by rabid or suspect animals. There is no new information.—E. MARTIN.

BERTHELON, M., & GORET, P. (1939). Vaginite spécifique de la chienne impubère déterminée par le virus de Carré. [**Specific Vaginitis in an Immature Bitch Caused by Dog Distemper Virus**].—*Bull. Acad. vét. Fr.* **12.** 222–225. 1 graph.

The authors suggest that the distemper virus may be responsible for some cases of vaginitis in young bitches. General malaise and a rise in temperature were accompanied by a purulent discharge from the vulva. One of two puppies which were inoculated subcutaneously with pus from the vagina showed symptoms typical of distemper infection. The infection was transmitted from this puppy to a ferret by the subcutaneous inoculation of blood.—E. C. HULSE.

I. LEVADITI, C., REINIÉ, L., & BEQUIGNON, R. (1939). Ultravirus et fluorescence. Corpuscules élémentaires de la vaccine et kératite vaccinale. [**Ultraviruses and Fluorescence. Elementary Bodies of Vaccinia and Vaccinal Keratitis**].—*C. R. Soc. Biol. Paris.* **130.** 704-707. [4 refs.]

II. LEVADITI, C. (1939). Ultravirus et fluorescence. Méthode d'estimation numérique des corpuscules élémentaires de la vaccine. [**Ultraviruses and Fluorescence. Method of Counting Elementary Bodies of Vaccinia by Fluorescence**].—*Ibid.* 849–852. [8 refs.]

I. A strain of vaccinia producing keratitis in rabbits showed numerous E.B.'s during the acute stage. They disappeared as resolution advanced. The relationship of E.B.'s to Guarnieri inclusions is discussed. [See also *V. B.* **10.** 94.]

II. The number of E.B.'s in any given system was determined by adding the suspension to a solution of thioflavine. The mixture was transferred to a quartz cell attached to the Zeiss cardioid fluorescence ultramicroscope. By examination with an ocular, fitted with a suitable diaphragm divided into small squares of known size, the number of E.B.'s could be determined.—R. E. GLOVER.

I. BEARD, J. W., FINKELSTEIN, H., & WYCKOFF, R. W. G. (1938). **The pH-Stability of the Elementary Bodies of Vaccinia.**—*J. Immunol.* **35.** 415–425. 1 fig., 1 table, 2 charts. [9 refs.]

II. SPRUNT, D. H., MARX, W., & BEARD, J. W. (1940). **Studies on the Infectivity of Vaccinal Elementary Bodies.**—*J. infect. Dis.* **66.** 53–58. 2 tables. [14 refs.]

III. SMADEL, J. E., LAVIN, G. I., & DUBOS, R. J. (1940). **Some Constituents of Elementary Bodies of Vaccinia.**—*J. exp. Med.* **71.** 373-389. 5 figs., 1 table. [Numerous refs.]

I. Well washed suspensions of vaccinal E.B's obtained from a rabbit dermal strain were suspended in buffered solutions ranging from pH 2·5–pH 11·5. Tests of infectivity at measured intervals showed that the stable region was between pH 4·5 and pH 10. The sedimentation constant, as determined in the Svedberg ultracentrifuge, gave a value for the E.B's about ten times greater than that of staphylococcal bacteriophage. The photographic boundaries were fairly sharp, indicating a certain homogeneity of the particles.

II. Experiments with purified vaccinia showed a considerable variation in the number of E.B's associated with an infective particle. The lowest number of elements required to cause infection was strictly governed by the conditions of the experiment. When the inoculum was contained in 0·25 c.c., the smallest number causing infection was 120, whereas if 0·05 c.c. was employed the number was greatly reduced. The susceptibility of the test animal also played a considerable part. It is suggested that in rabbits of relatively low sensitivity, the host inactivates a proportion of the material before a responsive cell is reached.

III. Pure suspensions of vaccinia E.B's were subjected to gentle disintegration and the various products obtained examined chemically. Treatment with dilute sodium hydroxide extracted about one-half of the dry weight of the virus. In addition to inorganic P, most of which occurred as nucleo-protein, the S antigen of Craigie was also detected.—R. E. GLOVER.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

SONI, B. N. (1939). **Further Observations on the Bionomics of the Ox Warble-Fly** (*Hypoderma lineatum* **de Villers) in India.**—*Indian J. vet. Sci.* **9.** 431–435. 1 text fig., 5 figs. on 1 plate. [6 refs.] [See also *V. B.* **9.** 627].

S. points out that the seasonal occurrence of *H. lineatum* varies considerably in different districts of India and that this must be taken into account in organizing control measures.

Young larvae have been found in the following parts of the body :– oesophagus, trachea, aorta, pleural membrane, diaphragm, rumen, neural canal and muscular tissues of the vertebral column. The oesophageal larvae can cause stenosis and haemorrhage in the gullet walls.

The infestation of sheep and goats with the larvae is recorded.—R. P. HOBSON.

SONI, B. N. (1939). **Studies on the Morphology of the Larval Forms of** *Hypoderma crossii* **Patton.**—*Indian J. vet. Sci.* **9.** 367–369. 5 figs. on 1 plate. [2 refs.]

This paper contains a detailed description of the young and full-grown larvae of *H. crossii*, collected from goats. The chief morphological features, which distinguish the full-grown larvae of *H. crossii* and *H. lineatum*, are indicated. Illustrations are included of the larvae of both species.—R. P. HOBSON.

NATVIG, L. R. (1939). Er *Hypoderma lineatum* De Villers almindelig i Danmark ? [**Occurrence of** *H. lineatum* **in Denmark**].—*Ent. Medd.* **20.** 222–230. 3 figs. [16 refs.] [English summary]. [Abst. in *Rev. appl. Ent.* **27.** 198–199, copied *verbatim*].

In connection with his work on the species of *Hypoderma* infesting cattle in Norway, the author examined material from the Zoological Museum of the University of Copenhagen and found that several specimens, labelled *H. bovis*, were *H. lineatum*. He discusses characters distinguishing the larvae of the two species and concludes that *H. lineatum* is commoner in Denmark than has been supposed.

KÁDÁR, M. (1934). Kolumbácsi légyraj okozta mérgezési esetek gyógyulása. [**Cure of Golubatz Midge Poisoning by Anti-Anthrax Serum**].—*Állatorv. Lapok.* **57.** 157.

K. mistook a case of Golubatz midge poisoning in a cow for anthrax and treated it with anthrax serum. Only after the administration of the serum was it discovered that the udder of the animal was covered with Golubatz midges. The midges were removed and the udder was cleaned. There was complete recovery within four hours of the administration of the serum.

K. then treated three further serious cases of Golubatz midge poisoning with anthrax serum. Similar rapid and complete recoveries occurred.—E. MARTIN.

BARANOV, N. (1939). K poznavanju golubačke mušice VII. Biološka svojstva golubačke mušice i njezine seobe u g. 1938. [**A Study of** *Danubosimulium*

columbaczense. **VII. Its Biological Characteristics and Its Migrations in 1938**].—*Vet. Arhiv.* **9.** 105–125. 1 fig. [19 refs.] [German summary].

D.c. infests the region along the Danube known as the " Iron Gate ". Migrations of several hundred kilometres are undertaken by the females, but the males do not leave the surroundings of their breeding places. Three types of *D.c.* are distinguished in larvae and pupae, according to their breeding places, *viz*, *litorale*, *intermedia* and *profundale*. Adults developed from the *profundale* type are smaller than those from *litorale* and are more richly coloured, and more poisonous and aggressive than the others.

Migration of the females is characterized by two different movements :– firstly by the usual " wandering ", not exceeding 5–6 km. per day ; secondly, the true " invasion ", consisting of an active ascent, high into the air, followed by passive travel with the wind (sometimes 100–150 km. within a few hours), an active descent and then another " wandering " of 5–10 km. per day in the invaded area.

The extent to which *D.c.* flies are venomous varies from individual to individual even within a sub-species. B. considers that the less poisonous *litorale*, which usually precedes *profundale*, immunizes domestic animals against the latter. Heavy losses are recorded after an extensive invasion of *profundale* into districts where no *litorale* have operated previously. While in Yugoslavia several species of *Simulium* suck animal blood only, *D.c.* attacks human beings as well as animals. Details are given concerning migrations of *D.c.* in 1938.

—B. Oswald (Novi, Yugoslavia).

de Jesus, Z. (1939). **Resistance of the Larvae of the Common Dog Tick and their Behavior on the Human Skin.**—*Philipp. J. anim. Indust.* **6.** 55–60. 4 tables. [9 refs.]

Experiments were carried out in order to ascertain the resistance of the larvae of *Rhipicephalus sanguineus* to (a) starvation, (b) hot water, and (c) lysol, creolin and kerosene. It was found that (a) the laying period was about 5 days, the incubation period about 25 days, and the survival of the larvae in the absence of the host about 35 days ; a natural method of eradication, therefore, would be to keep dogs away from infested premises for a period of at least 75 days ; (b) that larvae succumb in two minutes to water heated to a temperature of 55°–60°C. and that they are killed instantaneously by boiling water ; and (c) a 1% lysol solution proved the most effective.

It was also observed that the larvae did not bite the skin of three human beings aged seven, eleven, and thirty-nine respectively. Investigations, however, had still to be made to ascertain whether they attack the human skin at any other stage in their life cycle.

Bilal, S. (1939). *Ornithodorus lahorensis*, un vecteur possible de la tularémie. [*O. lahorensis* **as a Possible Transmitter of Tularaemia**].—*Bull. Soc. Path. exot.* **32.** 872–874.

O.l. is widely distributed in Turkey and its bites are known to be toxic to man and animals. A rabbit was inoculated subcutaneously with *Bacterium tularense* and *O. lahorensis* adults were fed on this animal for one hour a day for seven days. The ticks were then fed on six g. pigs, of which two died from acute *Bact. tularense* infection and four showed a chronic infection, confirmed by P.M. examination, cultures and inoculation experiments. Transmission was found to occur up to 205 days after the last feed on the infected animal. Suspensions made from ground-up ticks, 18 months after they had fed on an infected rabbit, were infective

to g. pigs and mice. G. pigs inoculated from ticks which had been dead for more than a month became infected.—S. J. GILBERT.

TRAGER, W. (1940). **A Note on the Problem of Acquired Immunity to Argasid Ticks.**—*J. Parasit.* **26.** 71–74. 1 table. [4 refs.] [Author's summary copied *verbatim*].

Chickens which had been repeatedly infested with nymphs and adults of *Argas persicus* did not show any immunity to these stages of the tick, which engorge in 5 to 10 minutes. The chickens did, however, exhibit a partial immunity to the larvae of *Argas persicus*, which require at least 4 days for engorgement.

Guinea pigs exposed to repeated infestation with *Ornithodoros venezuelensis*, all stages of which engorge rapidly, showed no immunity to any of the stages of this tick.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

OKABE, K. (1937). **On the Clonorchiasis in Yanagawa District, Fukuoka Prefecture.**—*Fukuoka Acta med.* **30.** 151–155. [In Japanese: English summary p. 7]. [Abst. in *Helminth. Abstr.* **6.** 84, copied *verbatim*].

In the Yanagawa district of the Prefecture of Fukuoka in Japan, Okabe finds that the first intermediary of *Clonorchis sinensis* is *Bulinus* (*Parafossarulus*) *striatulus japonicus* and *Pseudorasbora parva* the second intermediary. Dogs, cats, rabbits and white rats were experimentally infected.

DE WAELE, A. (1935). Le mécanisme physiologique des migrations et de la spécificité chez les cestodes. [**Physiological Mechanism of Migrations and Specificity in Cestodes**].—*XIIe Congr. int. Zool. Lisbonne, 1935.* **1.** 312–328. [2 refs.] [In French].

The author first refuted various theories of the mode of survival of cestodes in the digestive juices of the host. He found that the cuticle was impermeable during the life of the worm, but that immersion in gastric juice for a few hours rendered the cuticle permeable to pancreatic juice. Some mechanism is necessary, therefore, to protect larval cestodes in their passage through the stomach. He studied this mechanism in living specimens of various taenioid larvae.

In *Cysticercus pisiformis*, he found that evagination was brought about by peristaltic waves, originating in a special region of the cyst, and instigated only by the presence of bile salts, in a medium whose pH was over 6, and at a temperature of 37°–39°C. The larva was thus protected until it reached the intestine, where its protective covering, having been immersed successively in gastric and in pancreatic juice, was digested. The free larva survives only in the absence of glycocholate, however, and hence is infective only for the dog, whose bile contains no glycocholate. [*C.p.* is known to infect foxes and other wild carnivores].

In the coenurus of *Taenia multiceps*, he found that the scolices would evaginate freely in any medium of which the temperature and pH were favourable, but were prevented from doing so in the mouth by their surrounding layers of connective tissue. This tissue also served as protection against the gastric juice, but was itself dissolved away, so that the larva in the intestine was free to evaginate and begin its development. Its greater tolerance of bile salts gives it a greater range of final hosts.

In the hydatid, *Echinococcus granulosus*, evagination was conditional only on the tearing of the brood capsule in a temperature of 37°–39°C. Here the necessary

protection against the action of the digestive juices was afforded by curled up fragments of the thick outer cyst wall. Because of its tolerance for widely varying pH and bile-salt concentrations, the parasite has a wider host range than either of the other species studied.

[The above is only a broad outline of the arguments presented in the original article, which should be consulted by those interested in this subject.]—E. S.

HORSFALL, Margery W. (1938). **Observations on the Life History of *Raillietina echinobothrida* and of *R. tetragona* (Cestoda).**—*J. Parasit.* **24.** 409–421. 3 figs., 3 tables. [13 refs.]

H. has previously reported two species of ants, *Tetramorium caespitum* and *Pheidole vinelandica*, as intermediate hosts of *R. echinobothrida* and *R. tetragona*. The present article gives descriptions of the habits of these ants, inconclusive experimental infections of ants, seasonal distribution of the infections in ants, differential characters of larval and adult forms of the two cestodes (concerning which much confusion has occurred in the literature), and the geographical distribution of the intermediate and final hosts.

The investigation continued for 2½ years in a small yard in which rotting wood, sacks, etc., were left as cover for insects. At monthly intervals laboratory-reared chickens of various ages were placed in contact with chickens which were infested with *R.e.* or *R.t.* and which were constantly voiding gravid segments of these parasites. Two to 12 weeks after exposure groups of two or three birds were killed and examined and all specimens of *R.e.* and *R.t.* were collected and preserved. Invertebrates, especially insects, were collected twice weekly and examined for cysticercoids or fed whole to laboratory-reared chickens.

Cysticercoids were always found in the anterior part of the gaster of infested ants. Natural infection of ants was only found from June to December. Two cases of laboratory infection with *R.e.* are recorded. The intermediate hosts are more widely distributed in the U.S.A. than the cestodes.

Although no description of the development of the cysticercoids in ants is given, the observations made suggest that ants are infected during the larval stage and when in the deeper galleries of the nest, and that the cysticercoids and ants develop simultaneously.—C. V. WATKINS.

SHORB, D. A. (1939). **Preliminary Observations of the Effect on Sheep of Pure Infestation with the Tapeworm, *Moniezia expansa*.**—*Proc. helminth. Soc. Wash.* **6.** 77–79. 1 fig., 1 table. [3 refs.]

S. recovered cysticercoids from oribatid (" beetle ") mites collected on sheep pastures in Maryland, U.S.A., and fed them in varying numbers (51, 104, 110 and 203) on two or more days to four lambs, five months old, not previously exposed to parasitic infestation. Three of the lambs passed tapeworm eggs in their faeces after intervals of 37, 40 and 44 days respectively after the first feed. The fourth lamb (fed the greatest number of parasites) passed no eggs and was free from tapeworms at slaughter.—C. V. WATKINS.

KREIS, A. (1938). Beiträge zur Kenntnis parasitischer Nematoden VI. Parasitische Nematoden aus dem Zoologischen Garten in Basel. [**Parasitic Nematodes. VI. Nematodes from the Basle Zoological Gardens**].—*Zbl. Bakt. I. (Orig.).* **141.** 279–303. 10 figs., 4 tables. [Numerous refs.]

K. emphasizes the importance of knowledge of the helminths of captive wild animals in control of :– (1) pathogenic forms ; (2) those which may predispose to other diseases, and (3) species known to be infective for man (*i.e.* dangerous to keepers).

The following worms were believed to be partly or wholly responsible for the death of the host animal :– larvae and females of *Stenurus* sp. in nodules in the wall of the trachea of a Cape hunting dog (*Lycaon pictus*), causing fatal haemorrhagic pneumonia ; *Paraoesophagostomum polydentatum* in the caecum of an orang-outang, which died of chronic enteritis ; *Chlamydonema tumefaciens* in stomach and small intestine of *Pithecus fascicularis*, with mucous diphtheroid colitis, and *Toxocara mystax* from the duodenum of a lion with gastro-enteritis, osteomalacia and toxaemia.

Fasciola gigantica is recorded from the Bactrian camel. There are descriptions of several new species of nematodes.—E. S.

DESCHIENS, R. (1939). Procédé simple de récolte des larves strongyloides de nématodes dans les coprocultures. [**A Simple Method for the Collection of Nematode Larvae from Faeces**].—*Bull. Soc. Path. exot.* **32.** 165–169. 4 figs. [6 refs.]

After briefly describing the present known methods of collecting nematode larvae from faeces D. explains a new method which he considers suitable for all larvae exhibiting positive hydrotropism.

The method is simple : it avoids breaking and contamination of the faecal mass, and it yields large numbers of larvae. The apparatus consists of a small, fluted cone of Laurent filter paper, containing a few c.c.'s of distilled water. This is placed in a space of equivalent size, cleared in the centre of the culture. The larvae then find their way into the distilled water by climbing over the top of the cone, or occasionally by perforating it. The resulting larval suspension is free from faecal matter and thus suitable for experimental purposes. D. was able to extract large numbers of *Strongyloides* larvae from such a culture within 20–30 minutes.—KATHARINE SANDERSON.

I. DESCAZEAUX, J. (1939). Stérilisation biologique de crottins parasités par des larves de nématodes. [**Biological Sterilization of Faeces Containing Nematode Larvae**].—*Bull. Acad. vét. Fr.* **12.** 136–139. 1 fig.

II. DESCAZEAUX, J. (1939). Action des champignons hyphomycètes prédateurs sur les larves de certaines nématodes parasites des ruminants. [**Action of Predatory Fungi on the Larvae of Certain Nematodes of Ruminants**].—*Bull. Soc. Path. exot.* **32.** 457–459.

III. DESCHIENS, R. (1939). Capture et destruction de larves de strongylidés du singe et du boeuf par des hyphomycètes. [**Capture and Destruction of Strongyle Larvae from Monkeys and Bovines by Mould Fungi**].—*Ibid.* 394–398. [3 refs.]

IV. DESCHIENS, R. (1939). Considérations relatives à la destruction des larves de nématodes parasités par des hyphomycètes prédateurs. [**Destruction of Nematode Larvae by Predatory Fungi**].—*Ibid.* 459–464. [5 refs.]

I. Faeces containing strongyle eggs were mixed in a jar with powdered wood charcoal and water into a paste. Cultures, 15–20 days old, of the fungi *Arthrobotrys oligospora* and *Dactylella bembicodes* were grown in a Petri dish which was used as the lid for the jar containing the faeces culture ; strips of blotting paper were inserted into the jar to enable the larvae to climb up to the fungi. After four days, numerous rhabditiform larvae had reached the fungi. After 20 days, the entire faecal culture was devoid of larvae, as they had all been destroyed by the fungi. In another culture, in which *D. bembicodes* was used, some of the larvae were not killed by the mould, but developed into parthenogenetic females. Eggs and filiform, free, motile larvae were produced, but larvae and adults were all subsequently killed and digested by the fungi.

II. The same two fungi were used in the experiments, but they were grown in both solid and liquid media. The procedure was the same as in I. The effect of the fungi on the larvae of parasites belonging to the family *Trichostrongylidae* was studied. The larvae of *Haemonchus*, *Nematodirus*, *Cooperia*, *Ostertagia* and *Trichostrongylus*, which infest cattle and sheep, were all killed after 10 days. The author envisages the use of these fungi in the battle against human ancylostomiasis.

III. The effect was studied of the fungi *Arthrobotrys oligospora* and *Dactylella bembicodes* on the larvae of *Oesophagostomum bifurcum* of the monkey and certain strongyle larvae of cattle. In spite of their large size, the larvae were all destroyed by the fungi. The author suggests that these fungi could be used as a means of sterilizing pastures infested with strongyle larvae, since the two fungi are able to grow in the soil.

IV. A summary is given of the work done regarding the effects of predatory fungi on nematode larvae. In order that these fungi may be used in the control of parasitic diseases, certain important conditions must be considered :– (1) cultivation, collection and preservation of the fungi ; (2) practicable methods of broadcasting the fungi on infested pastures ; (3) development of the fungi in a natural environment, (4) the use of fungi not pathogenic for man or animals, and (5) the use of fungi not harmful to the pastures. The fungi are easily cultivated on the common media and grow readily on damp hay or straw. It is suggested that this damp hay or straw be dried, then powdered and sown manually on infested pastures, or spread by means of a mechanical sprayer. Experiments showed that the fungi grow on or in the soil under most climatic conditions and even in water, or on semi-flooded grazing land. The pathogenicity of the fungi for man and animals requires to be studied. The author experimented with two areas of grassland cultivated under the same climatic conditions. One was sown with the fungi *Arthrobotrys oligospora* and *Dactylella bembicodes*, and the other was allowed to grow naturally. After 50 days no harm had been done to the grass by the fungi.

—A. L. Wilson.

I. Macheboeuf, M., & Mandoul, R. (1939). Tentative d'isolement de la substance toxique contenue dans l'extrait d'*Ascaris megalocephala*. Quelques observations au sujet des propriétés de cette substance. [**Attempt to Isolate the Toxic Substance contained in the Extract of** *A. megalocephala*. **Some Observations on the Qualities of this Substance**].—*C. R. Soc. Biol. Paris.* **132.** 124–126. [1 ref.]

II. Mandoul, R. (1939). Recherches sur les propriétés biologiques de la substance toxique contenue chez *Ascaris megalocephala*. [**Research on the Biologic Properties of the Toxic Substance in** *A. megalocephala*].—*Ibid.* 126–128. [1 ref.]

I. Isolation of the toxic substance is a very difficult matter because the toxicity is destroyed by short exposure to a temperature of 100°C. or by holding in the refrigerator in a neutral or slightly acid medium for eight days. It is not precipitated by trichloracetic acid and does not pass through collodion dialysers. Toxicity may be due to polypeptides which were always present in the extracts, although this could not be confirmed. The toxicity is very great, 2 mg. of the extract being sufficient to kill a g. pig.

II. Attempts to produce anaphylaxis in the g. pig with the toxic extract described in the first paper failed, but a certain degree of immunity to a subseqtuen fatal dose was conferred. Examination of the blood for evidence of generalized eosinophilia gave negative results, but the coagulation of the blood in a g. pig which died from the effects of the toxic substance was retarded. Experiments

in vitro, however, with mixtures of blood and the toxic substance, revealed that the latter had no anti-coagulatory power.—A. L. WILSON.

OLAFSSON, A. (1939). Ist die Ausscheidung von Spulwurmeiern im Kot der befallenen Füchse zeitweilig unterbrochen ? [**Intermittency of Egg Excretion by Ascarids in Foxes**].—*Dtsch. tierärztl. Wschr.* **47.** 408–409. [4 refs.]

The most important facts in this article have been reported in *V. B.* **9.** 861. —A. L. WILSON.

MORGAN, D. O., & WILSON, J. E. (1939). **The Occurrence of *Heterakis gallinae* and its Relation to Disease, Breed and other Helminths.**—*J. Helminth.* **17.** 177–182. [3 refs.]

Attempts to induce heavy infestations with *H. gallinae* under experimental conditions have not been successful. Under natural conditions the incidence is heavy in healthy and diseased birds. Disease alone is not the only factor which predisposes to infestation; the authors postulate some factor or factors which break down the resistance to infestation which appears to operate under experimental conditions. The data for this paper were obtained from observations made on 230 diseased birds at a series of egg-laying trials, *i.e.* birds in a state of heavy production. The majority of deaths occurred in birds between six and 16 months of age. With the exception of TB., no association was noted between the incidence of *H. gallinae* and any of the diseases with which the birds were affected. In this, as in a previous communication [*V. B.* **9.** 397.] tuberculosis was associated with few if any parasites. In only three of the 230 cases was death attributed to parasitism.

The authors analysed statistically the figures obtained from a study of the incidence of this parasite in the three major breeds represented at the trials. The incidence of *H. gallinae* was greatest in the White Leghorns, a little less in the Rhode Island Reds, and least in the White Wyandottes.

It was noted that, in both diseased and healthy birds, a relationship existed between infestation with *H. gallinae* and with other parasites, *i.e.* where infestation with other parasites was heavy *H. gallinae* was numerous and conversely, where other parasites were few, *H. gallinae* was present in small numbers only. It is suggested that the presence of other worms seems to be a factor operating upon the development of *H. gallinae* under natural conditions.—L. E. HUGHES.

TAYLOR, E. L. (1939). **The Diagnosis of Helminthiasis by Means of Egg Counts, with Special Reference to Red-Worm Disease in Horses.**—*Vet. Rec.* **51.** 895–898. 4 figs.

It is suggested that the technique described should be adopted generally by those who are called upon to diagnose helminthiasis in animals, principally because it is almost impossible to make reliable comparisons between the results obtained by clinicians using the various tests in common use. Continued use of the test, moreover, will enable each user to decide the level of egg output above which an animal may be regarded as diseased and below which an animal may be regarded as healthy. It is doubtful whether an exact standard egg count for health and disease will ever be fixed because the counts per g. of faeces vary so greatly. The borderline, however, may tentatively be fixed for parasitic gastritis in lambs at from 2,000–6,000 eggs per g., for parasitic gastritis in cattle at 300–600 eggs per g., for strongylosis in equines at 1,500–2,500 eggs per g., for fascioliasis in sheep at 300–600 eggs per g. and for fascioliasis in cattle at 100–200 eggs per g.

The technique is very fully described and is simple. It consists of estimating, by direct count, the number of eggs in a strained 3 g. sample of faeces.—A. L. W.

BRITTON, J. W. (1939). **Trichostrongylosis in Equines.**—*Cornell Vet.* **29.** 322–330. 3 tables. [17 refs.]

A general paper describing the pathology and diagnosis of the infestation. A 17-month-old Jersey steer was isolated and regarded as parasite-free on the basis of negative faeces cultures and egg counts over a period of three weeks. This animal was then given 2,000 infective equine *T. axei* larvae. During the subsequent fourth and fifth weeks, 100 eggs per g. were obtained from the faeces and only *T. axei* larvae were obtained from faecal cultures. This is considered to confirm that the parasite can be transmitted from horses to cattle.—A. L. WILSON.

ISSHIKI, O., & OGATA, S. (1937). **On a Nematode,** *Capillaria bovis* **(Schnyder, 1906), from a Chosen Calf.**—*J. Jap. Soc. vet. Sci.* **16.** 240–249 of pt. 1. 4 figs. on 1 plate, 1 table. [5 refs.] [In Japanese: abst. from English summary p. 27 of pt. 2].

In September 1935 two gravid females of *C. bovis* (Schnyder, 1906) were found in the duodenum of a calf from south Chosen, used for the production of rinderpest vaccine. The authors believe that this is the first report of this species from cattle in Japan.

WETZEL, R., & ENIGK, K. (1938). Zur Biologie von Dictyocaulus arnfieldi, dem Lungenwurm der Einhufer. I. Mitteilung. II. Mitteilung. [**The Biology of** *Dictyocaulus arnfieldi*, **the Lungworm of Equines. I and II**].—*Arch. wiss. prakt. Tierheilk.* **73.** 94–105 and 106–114. 8 figs. [Numerous refs.]

A description of the parasite's life-cycle is given and the known geographical distribution is mentioned. It was found that, contrary to generally accepted opinion, the larvae do not hatch out in the bronchi of the host.

In water cultures the first moult of the larvae took place in 24 hours and the second moult in a further 48 hours. In cultures 6–8 days old, first and second stage larvae predominated, while most of the third stage larvae died in 14 days and none survived 22 days' cultivation. This difficulty in cultivation suggested the existence of an intermediate host. Moisture and coolness are essential for the development of the larvae; they succumbed to drying for eight hours. The infective larvae withstood freezing at −1°C. for eight days. A 2% solution of phenol killed them in 20 minutes at 10°C., while a 1% solution of lysol killed them in 22 minutes and a 2% solution in 13 minutes.

The further development of the parasite, through the fourth and fifth larval stages to the adult worm, was studied in g. pigs (useless for the purpose), three foals, two aged horses and an ass. A six-week-old foal was killed three days after infection; many infective larvae were present in the swollen mesenteric lymph nodes. A few larvae were also seen in the lungs.

A 15-year-old horse was fed with infective larvae 13, 11, 9 and 7 days prior to slaughter. Fourth stage larvae were seen in the lung parenchyma and young fifth stages in the bronchi and bronchioles. The authors conclude that the third moult occurred at the fifth day and the fourth moult at the 11th or 12th day. The time taken for the parasites to reach sexual maturity was estimated to be 39 days after infection, since larvae were then first recovered from the faeces of an eight-year-old horse.

Clinically, the symptoms differed in the ass and the horse. In the former, bronchial trouble could be diagnosed only by auscultation, whereas in the latter, coughing, inappetance and emaciation were seen. The horses and foals did not show any symptoms until 14 days after infection, at which period a dry cough was manifest, coincident with the period when the young fifth stages were entering

the bronchi and bronchioles. Subsequently, the coughing became more severe and lasted for minutes on end. As far as could be ascertained, the duration of infestation was 15 months in the ass and six months in the horse. It is concluded that the parasite is better adapted to the ass than to the horse, and that the relationship between the ass and the parasite is older than that between the horse and the parasite. The ass must therefore be regarded as the true host.

In a foal, killed 14 days after dosing with infective larvae, young fifth stage larvae were found in the bronchi. The parasites occluded the lumen and an exudate containing a preponderance of eosinophile leucocytes was present.—A. L. WILSON.

FUJITA, J. (1938). **On a Nematode, *Strongyloides papillosus* Wedl, 1856 from Sheep.**—*J. Jap. Soc. vet. Sci.* **17.** 152–169 of pt. 1. 11 figs. on 2 plates, 5 tables. [20 refs.] [In Japanese: abst. from English summary pp. 21–22 of pt. 2].

The summary contains short descriptions, with measurements, of the various stages of the parasite. The stages described are:– the female of the parasitic generation, the direct and indirect rhabditiform larvae, the direct and indirect filariform larvae and the adult male and female of the free-living generation.

—A. L. WILSON.

POPESCU-BARAN, M. (1939). Nouvelles recherches sur l'*Onchocerca bovis* chez les bovidés de France. Localisations synoviales. [**New Research on *O. bovis* in French Cattle. Synovial Localizations**].—*Bull. Soc. Path. exot.* **32.** 621–625.

Only four out of 60 stifle joints of bovine quarters examined were free from *O.b.* The parasites were found in the tendons of the stifle joint and in the periarticular connective tissue. The joints were inflamed and oedematous and several calcified areas were seen. In several joints, the parasites had perforated the synovial epithelium and were in contact with the synovial fluid itself. Some of the parasites were alive, but some were impregnated with calcium, white in colour and were, therefore, regarded as dead.—A. L. WILSON.

ROTH, H. (1938). **Experimental Studies on the Course of Trichina Infection in Guinea Pigs. I. The Minimum Dose of Trichina Larvae Required to Produce Infestation of the Muscles; with an Account of the Potential Productiveness of the Female Trichina.**—*Amer. J. Hyg.* **28.** 85–103. 2 tables. [Num. refs.]

The experiments proved that g. pigs are more susceptible to *T. spiralis* than rats, mice, rabbits, dogs or cats. Moreover, the parasites live longer in the intestine of the g. pig and consequently the productivity of the females is greater.

In a first series of experiments, in which the sex of the larvae used was not determined, four g. pigs were given 6 or 10 larvae each. Only one of the g. pigs, one which had received 10 larvae, became infected, having about 200 encysted larvae. Theoretically, the number of female larvae in the infecting dose was estimated at between $\frac{2}{3}$ and $\frac{3}{4}$ of the dose and, working on this basis, 10 other animals showed an average infestation of 1,700 larvae per female ingested after being infected by from 12–30 larvae.

A second series of experiments, in which the sex of the larvae was determined, showed that the ratio of encysted larvae to each female larva ingested varied from 1,000 : 1 to 2,500 : 1, rates of from 1,500 : 1 to 2,000 : 1 being apparently most frequent. It should be remembered, however, that the number of larvae produced by a single female should be regarded as being much higher than the number of larvae found in the digested muscles.—A. L. WILSON.

IMMUNITY

I. SMITMANS, H. (1938). Ueber die Verwendungsmöglichkeit der Abortus-Bang-Ringprobe (ABR) bei der Rohmilchuntersuchung. [**Value of the Ring Test (ABR) for the Demonstration of** *Br. abortus* **in Raw Milk**].—*Berl. Münch. tierärztl. Wschr.* October 21st. 646–647. [7 refs.]

II. HERMANN, G. (1939). Beitrag zur Kenntnis der Abortus-Bang-Ringprobe (ABR.) sowie zur Herstellung eines Bunttestes mit künstlich (schnell) gereiftem Hämatoxylin. [**Diagnosis of Brucellosis by the Abortus Ring Test and a Colour Test using Haematoxylin**].—*Ibid.* March 10th. 158–160. 1 fig. [6 refs.]

III. FLEISCHHAUER, G., & CANIČ, R. (1939). Ueber weitere Versuche mit der Abortus-Bang-Ringprobe (ABR.) zur Untersuchung von Milchproben auf Abortus Bang. [**The Ring Test for** *Br. abortus* **for Testing Milk Samples**].—*Ibid.* April 14th. 238–240. [7 refs.]

I. The ring test [*V. B.* **8.** 656.] for *Br. abortus* infection was compared in 233 cases with the tube agglutination test, with blood serum, in 729 with the slide agglutination test (with milk) and in 264 with the tube agglutination test using milk. The discrepancies were 2·21%, 0·013% and 0·76% respectively.

II. The literature on the ring test for abortion is discussed and practical details given for the preparation of a haematoxylin staining solution and the carrying out of the test.

III. A modification of the ring test of milk for *Br. abortus* infection is described. The mixture is centrifuged for eight minutes at 2,500 R.P.M. and the deposit examined. A positive result is shown by the presence of a small circumscribed deposit in the centre of the bottom of the centrifuge tube. If negative. the deposit is a diffuse mass occupying the whole of the bottom of the tube. Four types are recognized:–(1) strong positive, (2) medium positive, (3) weak positive and (4) negative, and diagrams are given of these. It is claimed that this modification gave 3·5% more positives in 568 tests than the original ring test, and 1·3% more than the slow agglutination test with milk.—P. S. WATTS.

BIRKHAUG, K. (1937 & 1939). **Allergy and Immunity (Iathergy) in Experimental Tuberculosis. I. Dispersion of Tubercle Bacilli in the Normal, Allergic and Anergic (Desensitized) Guinea Pig. II. Statistical Interpretation of the Degree of Tuberculosis in the Superinfected Allergic and Desensitized Anergic (Iathergic) Guinea Pig. III. Degree of Tuberculosis in BCG—Immunized Guinea Pigs Reinfected in the Allergic and Desensitized (Iathergic) State. IV. Degree of Tuberculosis in Guinea Pigs Prevented from Becoming Tuberculin Hypersensitive.**—*Acta tuberc. scand.* **11.** 25–53 and 119–256, **13.** 163–192 and 221–250. Numerous text figs., 53 figs. on 11 plates, 27 tables, 7 charts. [Numerous refs.] [In English]. [Pt. IV, author's summary copied *verbatim*].

I. Almost half of this part is devoted to a historical survey of research on immunity and hypersensitivity to TB.

Dispersion *via* the lymphatic, venous and systemic circulations, of virulent eugonic human TB., injected in minimal doses (approx. 500 bacilli) directly into the cervical lymph nodes of TB.-negative g. pigs, occurred as early as three days after injection.

In g. pigs previously made allergic to tuberculin by subcutaneous injection of virulent, dysgonic bovine TB., dispersion of eugonic human TB., as above, occurred as late as five weeks after injection and completed the circuit of the body in 6–8 weeks.

In g. pigs made allergic as above, and subsequently desensitized by regular, gradually increasing doses of old tuberculin, dispersion of the superinfected eugonic strain occurred as late as seven weeks after injection, and completed the circuit of the body in 8–11 weeks.

Macroscopic and microscopic examination of the lesions showed them to be about 50% more necrotic, caseous and extensive in the allergic than in the anergic animals.

II. A strain at first thought to be a dissociated variety of rough BCG culture, and previously described [*V. B.* **5.** 541 and 600.] as the S variety of BCG, is now named *Mycobacterium caviae* n.sp., with the abbreviation M.C.

The intradermal inoculation of 10 mg. of BCG or M.C. antigens alive or killed at 65°C., was found to produce in normal g. pigs a statistically significant resistance to superinfection by a virulent strain, together with a high degree of tuberculin allergy. The same antigens killed at 119°C. were without allergizing and immunizing properties.

The term iathergic is defined. The results of the experiments described in part I are elaborated and statistically analysed.

III. An account of detailed experiments, using larger numbers of animals, designed to test the results recorded in part I. 0·00001 mg. highly virulent dysgonic bovine TB. was inoculated subcutaneously into three groups of 28 g. pigs each. The first group had previously been rendered allergic by intradermal inoculation of BCG ; the second group, after being made allergic, had been made iathergic by means of daily injections of Koch's old tuberculin ; the third group consisted of normal, TB.-negative animals.

About 150 days after the virulent inoculation, 20 of the surviving animals of each group were killed and autopsied. The weight of the lymph nodes, lungs and spleen, and the volume of the lymph nodes and the abscess formed at the site of inoculation, were all significantly lower in the iathergic animals than in the controls. No significant difference occurred between the allergic animals and the controls. None of the iathergic group had generalized TB., whereas 11 out of the allergic and 13 of the control animals had generalized or fulminating TB. The iathergic animals, however, showed the smallest gains in weight, due to the harmful effects of the continued tuberculin injections.

B. concludes that allergy is not a reaction useful to immunity, and rather counteracts the beneficial defence mechanism of acquired TB. resistance. [Table IV referred to several times in the text, is missing].

IV. G. pigs infected with virulent bovine tubercle bacilli have been prevented from becoming hypersensitive by thrice weekly subcutaneous injections of tuberculin during 5 post-inoculation months.

A quantitative assessment of the tuberculous lesions in the viscera has shown that the spread of tuberculosis and the development of pulmonary foci teeming with bacilli are significantly retarded in the non-immunized and completely desensitized organism.

These observations indicate that the phenomena of tuberculin hypersensitiveness are an unessential part of the mechanism of acquired defence against tuberculosis.

Ramon, G. (1939). La production des toxines diphtérique, tétanique, staphylococcique en vue de l'obtention des anatoxines correspondantes. Techniques —resultats. **[The Production of Diphtheria, Tetanus, and Staphylococcus Toxins with a View to Obtaining the Corresponding Anatoxins. Technique and Results].**—*Rev. Immunol.* **5.** 385-404. [Numerous refs.]

Research work carried out during the last 12 years with a view to producing

diphtheria, tetanus and staphylococcus toxins of relatively constant high antigenic value is described in detail. Preliminary experiments with tetanus toxin showed that culture in peptone broth, containing sodium pyruvate, monopotassium phosphate and glucose, yielded toxin of three to four times the potency of that obtained in ordinary broth. Methods are described of preparation on various media of tetanus anatoxin with an average potency of 30 units. Several improved methods are given for preparing staphylococcus toxin of satisfactory antigenic value on a variety of media, including one of known chemical composition, without peptone, which yielded 40 units of toxin per c.c. according to the results of flocculation tests. Both toxins produced correspondingly potent antitoxic sera and the derived anatoxins proved very efficacious for immunization against tetanus and for the prevention and treatment of staphylococcal infections.—R. O. Muir.

Vacirca, F. (1939). La glutathionémie chez le cheval injecté par des toxines bactériennes et par venins d'animaux. **[Glutathionaemia in Horses Injected with Bacterial Toxins and Animal Poisons].**—*Boll. Sez. ital. Soc. int. Microbiol.* **11.** 85–90. [2 refs.] [In French].

Studies on glutathionaemia in horses during the immunizing treatment for the production of therapeutic sera showed that injections of the antitoxin and toxin of tetanus, the toxins of *Corynebacterium diphtheriae* and *Bacillus welchii* and the venom of a south-eastern European viper (*V. ammodytes*) caused variations in the glutathione content of the blood. In most cases an appreciable decrease occurred and persisted for some time, but the degree and duration of the hypoglutathionaemia differed in different animals even under identical procedures.—R. Allcroft.

Országh, O., & Alföldy, J. (1940). **A Coagulative Serum Prepared by Injecting Hirudin into Animals.**—*Lancet.* **238.** 28–29. 2 tables. [3 refs.] [Authors' summary copied *verbatim*].

Repeated injections of hirudin into rabbits makes their blood resistant to the ordinary anticoagulative effects of this substance. The serum of animals thus immunised, when added to blood from other animals, accelerates coagulation. The action of this " immune " serum on coagulation is much more powerful than the action of normal serum. Smaller quantities can therefore be used and troublesome secondary effects are correspondingly less likely.

Romaña, C. (1939). Utilisation de la méthode des précipitines pour l'identification du sang ingéré par certains réduvidés. **[Identification by the Precipitin Test of Blood Ingested by Reduviidae].**—*Bull. Soc. Path. exot.* **32.** 625–628. [4 refs.]

It is pointed out that when reduviid bugs are found infected with *Trypanosoma cruzi* it is important to know on what animals they have been feeding in order to identify those animals which may act as reservoir hosts of the trypanosomes. Precipitating sera, specific for the host blood, made in rabbits by the techniques of Laurel (1931) or Wolfe (1935) were satisfactory, but it was found that good sera could be made by diluting the sera used as antigen 1 : 10 in physiological saline and administering it intravenously in doses of 0·1, 0·2 and 0·5 c.c. at intervals of two days. This reduction in quantity may be important when small rodents are under experiment. Blood from larvae of *Rhodnius prolixus* fed on various animals, and *Triatoma infestans* fed on sheep gave positive precipitin tests for the specific host on which they had been fed, up to 10 days after leaving this host, and in some cases up to 30 days. It appears that the nature of the meal can be identified in Hemiptera for a much longer period than in Diptera.—U. F. Richardson.

WIENER, A. S., & SILVERMAN, I. J. (1940). **Permeability of the Human Placenta to Antibodies. A Quantitative Study.**—*J. exp. Med.* **71.** 21–27. 1 table. [Numerous refs.]

In reviewing the literature on the permeability of the human placenta to antibodies the authors draw attention to the fact that there is a quantitative difference in the amounts of antibodies in the maternal blood and the cord blood. It has also been found that in some cases isoagglutinins are lacking in the cord blood even when the child belongs to the same blood group as the mother. The titres of the following antibodies were estimated :– the iso-agglutinins α and β, hetero-agglutinins for rabbit and sheep blood, and syphilitic reagin in both maternal and cord bloods. The results were expressed as a ratio of the titre of the particular antibody measured in the maternal blood to the titre of the same antibody in the foetal blood. The true value of this ratio was found to be between one to eight and one to 16 in all tests performed (56).

This explains why iso-agglutinins may appear to be absent from certain cord bloods. If the titre in the maternal blood is much less than one in eight there will not be enough iso-agglutinin present in the cord blood to be detectable by the standard technique employed. The claims that natural hetero-agglutinins for sheep cells do not pass through the human placenta were also found to be explained by the fact that these agglutinin titres were below one in eight in the maternal blood.—D. L. HUGHES.

MAIGNON, F. (1939). Théorie fermentaire de l'immunité. [**Ferment Theory of Immunity**].—*Rec. Méd. vét.* **115.** 513–522. [6 refs.]

The production of endo- and exotoxins by bacteria is discussed. M. mentions the incubation period of certain bacterial diseases, and suggests that this is necessitated by the delay in conversion of pre-toxin into true toxin by the tissues of the invaded subject.

Anaphylaxis is similarly explained by production in the body, as a result of the sensitizing injection, of a toxogen which, in contact with the antigen introduced at the second inoculation, gives rise to apotoxin, the latter creating the anaphylactic crisis. The precise mechanism of anaphylaxis as variously explained is analyzed. Two stages in the production of anaphylactic toxin are described. A parallel is drawn between this and the production of antibodies by the host invaded by pathogenic organisms.

It is stated that the closer the particular bacterial toxin chemically approximates to tissue protein end-products, the less likely is one attack by such an organism to lead to immunity. The relation between anaphylaxis and immunity is discussed at length, stress being put on the role of the former in initiating the latter.—H. B.

DISEASES, GENERAL

SMITH, J. H. (1933). **A Report on the Investigation of Diseases of Elephants carried out at Sick Elephant Camp (No. 2) at Minbyin, Upper Burma, from December 1st, 1932 until March 7th, 1933.** pp. 25. Rangoon : Supt. Govt. Printing and Stat. [8vo] [Annas 8] [9d.]

[This is an account of the treatment of elephants affected with certain parasites. The title is misleading.]

Eleven debilitated elephants, considered to be suffering from the effects of internal and external parasites, were subjected to treatment. Routine examinations

of blood and faeces were carried out, and a number of lice, warbles, bots, roundworms and amphistomes collected and sent for identification. Three elephants with microfilariae in the blood stream were isolated.

The treatment given to each elephant, for both internal and external parasites, is described. Various anthelmintics were tried, and treatment was usually followed by a course of tonics.

Oil of chenopodium is stated to have been the most effective agent against nematodes and amphistomes, but the treatment advocated as the most suitable and practicable is the administration of tartar emetic and ferrous sulphate over a period of 12 days, followed by a purgative. Carbon disulphide was effective against stomach bots. Derris preparations were used for lice and warbles.

An outline is given of the conjectured life-history of the bot fly, *Cobboldia elephantis*. The probable life-history of the warble fly of the elephant, *Elephantoloemus indicus* is also outlined.

All the animals were discharged for duty in " fair " condition after about three months in the camp.

[No controls were kept, and it seems probable that some, at least, of the improvement in condition was due to rest and good diet. To one used to treating ordinary domestic animals in the East, the doses of the various drugs used, particularly of the common purgatives, appear somewhat small].—F. J. ANDREWS.

I. CHITTY, D., & ELTON, C. (1937). **Canadian Arctic Wild Life Enquiry, 1935-36.**—*J. Anim. Ecol.* **6.** 368-385. 4 figs. on 2 plates, 2 tables. [14 refs.]

II. & III. CHITTY, D. (1938 & 1939). **II. Canadian Arctic Wild Life Enquiry, 1936-37. III. Canadian Arctic Wild Life Enquiry, 1937-38.**—*Ibid.* **7.** 381–394, and **8.** 247–260. 4 text figs., 4 figs. on 2 plates, 6 tables. [3 refs.]

I, II, & III. These papers comprise the reproduction and analyses, by the Bureau of Animal Population, of information obtained by the questionnaire method from outposts in the Canadian Arctic. Of veterinary interest are the data relating to disease amongst sledge-dogs, which form a continuation of an earlier study by ELTON, " Epidemics among sledge-dogs in the Canadian Arctic and their relation to disease in the arctic fox " [*Canad. J. Res.* **5.** 673. (1931)]. In many areas disastrous epizootics appear amongst the sledge-dogs, and these usually take the form of what is locally termed " crazy disease ", the symptoms of which are held to correspond closely with those of GREEN's fox encephalitis. Half-bred and non-sledge dogs appear to be immune ; (white) foxes suffer from the same or a similar disease under natural conditions and this is associated with the periodic fluctuations in their numbers. In areas in which both fox and dog epizootics have appeared, observers are of the opinion that the diseases are identical, and it is also suggested that they tend to appear when the local lemming population has reached its cyclic peak. The need for an intensive pathological study of " crazy disease " was stressed by ELTON in the paper to which reference is made above.
—ALASTAIR N. WORDEN.

PABIJANSKAS, A. (1938). Kova su galviju tuberkuloze, bruceloze bei mastitais 1937 metais. [**Control of Bovine Tuberculosis, Brucellosis, and Mastitis in Lithuania in 1937**].—*Vet. ir Zootech., Kovno.* **15.** 114–121. 5 tables. [German summary].

By June 1938, 8,292 farms, comprising 89,114 head of cattle, had joined the voluntary state TB. eradication scheme. During 1937, intradermal tuberculin tests were carried out on 70,151 cattle in 5,658 herds, in addition to clinical examination ; 4,365 animals (6·2%) gave positive reactions. Open TB. was diagnosed in

166 (0·23 %), which were immediately slaughtered. During the year the number of cattle reacting positively to the tuberculin test was reduced by 2·3 %, and that of cattle with open TB. by 0·35 %.

In the brucellosis campaign, 35,750 blood samples, 29 milk samples and 9 other samples of material were examined during 1937. For examination of blood samples the agglutination test was used, followed in doubtful cases by the complement-fixation test. By the end of 1937, there were 234 farms known to be infected.

There was no systematic campaign against mastitis.

PEATT, E. S. W. (1940). **Contagious Diseases of the Horse Under War-Time Conditions. With Special Reference to Diagnosis and Treatment.**—*Vet. Rec.* **52.** 57–60.

P. discusses the more common diseases of army horses during the war of 1914–1918. There is no new material.—R. FISHER.

DE LAMARLIÈRE, A. (1939). Observations sur une enzootie de paraplégie infectieuse. [**Observations on an Enzootic of Equine Infectious Paraplegia**].—*Bull. Acad. vét. Fr.* **12.** 191–196.

Reference is made to failure to cure three cases of equine infectious paraplegia by treatment with uroformine. The remarkable response of another three cases of the disease to treatment with rubiazol and soluseptasine was considered by the author to indicate that streptococci were the cause of the disease.—R. O. MUIR.

JONES, V. B. (1938). **Navicular Disease.**—*Vet. J.* **94.** 347–354. 3 figs. on 1 plate, 3 tables, 2 graphs.

J. reports on three lame horses, one of which had enlarged fetlock joints and the other two navicular disease. From each of the first two he removed an enlarged thyroid and from the third a cystic thyroid. In each case the abnormality was unilateral. The parathyroids were not located. In all three cases the general condition of the animals greatly improved; the lameness also improved, but at the time of writing it was too early to say whether this was permanent. The abnormalities encountered were colloidal goitre, cystic thyroid and an inactive thyroid gland. Biochemical and biophysical analysis of the blood of normal and diseased horses has yielded no information. J. speculates as to whether there was any connexion between tne thyroid disease and the osteo-dystrophic conditions.
—R. FISHER.

HUPBAUER, A., & ZAHARIJA, I. (1939). Virusni pobačaj kobila. [**Virus Abortion in Mares (in Yugoslavia)**].—*Jugoslov. vet. Glasn.* **19.** 253–257. 1 table. [4 refs.]

This is the same as a paper published elsewhere [*V. B.* **9.** 568].
—B. OSWALD (NOVI, YUGOSLAVIA).

I. PICKERING, J. P. (1939). **Differences in Clinical Pictures of Transit Fever and Haemorrhagic Septicaemia.**—*Vet. Rec.* **51.** 277–279.

II. DOWNHAM, K. D., & YARROW, T. B. (1939). **Haemorrhagic Septicaemia in Cattle.**—*Ibid.* 279–280. [See also *V. B.* **9.** 607].

I. Transit fever is a febrile catarrh of recently imported store cattle; complications of lobar pneumonia and gastro-enteritis are frequent. The aetiology is obscure; the condition is characterized by a gradual onset and a course of about seven days. The symptoms include anorexia, fever, catarrh,

and constipation, but no great respiratory distress is evident. Autopsy usually reveals lobar pneumonia without oedema, abomasitis and sometimes intestinal catarrh.

H.S., as it occurs in the United Kingdom, is a general septicaemia of English-bred fattening cattle. Numerous bipolar organisms may easily be demonstrated in exudates. The onset is very rapid, and the course six hours to three days. Symptoms include fever, great pain, dyspnoea, oedema of the throat, and injection of the mucous membranes. Autopsy reveals hyperacute inflammation of the abomasum and small intestine, with deep congestion of the lungs, in six-hour cases, and broncho-pneumonia, with oedema, petechial haemorrhages, and inflammation throughout the bowel, in three-day cases.

II. An account is given of an outbreak of bovine pasteurellosis in Shropshire, and cases are described in two cows and a calf. Smears from the spleen, lymph nodes and blood revealed numerous bipolar organisms; inoculation of material from lymph nodes caused death in g. pigs and rabbits, and pasteurella were isolated from them.—D. D. Ogilvie.

I. Rossi, P. (1938). L'urée sanguine dans la broncho-pneumonie infectieuse ou influenza des bovidés. [**The Blood Urea in Infectious Bovine Broncho-Pneumonia**].—*C. R. Soc. Biol. Paris.* **127.** 1406–1407. [2 refs.]

II. Rossi, P. (1938). Urée et chlorures du sérum dans la broncho-pneumonie infectieuse ou influenza des bovidés. [**Urea and Chloride Content of the Serum in Infectious Bovine Broncho-Pneumonia**].—*Ibid.* **128.** 167–177. [1 ref.]

I. The onset of pulmonary symptoms in "infectious broncho-pneumonias" of cattle was shown in some 100 affected animals to be marked by an increase of blood urea to a degree directly proportionate to the ultimate severity of the lung lesions. The urea content of the blood fell as pulmonary resolution took place. Systematic estimation of blood urea under these circumstances is of considerable prognostic value.

II. In 60 cattle affected with infectious broncho-pneumonia it was found that the amount of chlorides in the blood altered very slightly from normal, but in a direction contrary to that of the blood urea.—G. Williamson.

Kaushal, R. S. (1939). **Three Days Cattle Fever.**—*Indian vet. J.* **15.** 303–306.

K. discusses three-day sickness (ephemeral fever) of cattle.—R. Fisher.

Myhill, B. A. (1940). **Low Birth Rate of Calves and Calf Mortality.**—*Rhod. agric. J.* **37.** 98–101.

The most important factor influencing the birth rate of calves in Rhodesia is the long periods of drought. On one large ranch the birth rate dropped between 1926 and 1936 from 72% to 24%. Indifferent animal management and contagious abortion are contributory causes. Calf mortality may be attributed to inadequate food supplies, bad hygienic conditions, tick-borne diseases, blackleg, internal parasites or predatory carnivora.—R. Fisher.

Swett, W. W., Matthews, C. A., & Graves, R. R. (1939). **Injury or Infection in Udders of Heifers may Terminate in Blind Quarters.**—*J. Dairy Sci.* **22.** 993–1006. 7 figs. [2 refs.]

Numerous cases have been observed of blind or deficient quarters of the udder in heifers following calving. In every instance except one, where pus discharge from the teat occurred in the calf or young heifer, the affected quarter failed to

function. In nearly every case where udder infection was found in the calf, the affected quarters were abnormal in development for a time, but filled out about the same as the unaffected quarters before calving. After calving, milk was not obtained and a marked decrease in size soon followed. Following infection or injury, a scar or fibrous tissue may form near the cistern, occluding the duct and thus preventing the removal of milk, resulting in involution of the tissue.—R. F.

DARRASPEN, E., FLORIO, R., & MEYMANDI, M. (1938). Le syndrome humoral dans les hépatonéphrites aiguës du chien, secondaires à la maladie de Carré. [**Humoral Syndrome of Acute Hepatonephritis Secondary to Distemper in Dogs**].—*Rev. Path. comp.* **38.** 1176–1178.

In man acute hepatonephritis is characterized by increase in blood urea and " polypeptides " [presumably amino-acid N], and decrease in blood chlorides. In the hepatonephritis accompanying distemper in the dog, a considerable " azotaemia " occurs [presumably non-protein nitrogen (N.P.N.)], especially in the blood urea fraction, with a lowered alkali reserve but with a normal or even increased blood chloride content. Arguments are given for considering this " azotaemia " as primarily of renal origin, since, although the deranged liver may itself produce increased quantities of urea, the dog's kidney has a far greater capacity for excretion of urea than that of man. The authors state that the estimation of " polypeptides " has been shown to be of great value in prognosis since any rise in blood polypeptides, with or without " azotaemia ", shows a doubtful or bad prognosis. Blood cholesterol determinations are of value, being increased in favourable cases and considerably lowered just before severe attacks.

[Since there are no references to analytical methods, the abstractor has taken the term " azotaemia " to mean " increase in blood N.P.N.", of which urea forms the greater part. Similarly " polypeptides " are taken as referring to amino-acid N; chemically, polypeptides are compounds formed by the linkage of three or more amino-acids.]—ALFRED EDEN.

HAMMON, W. D., & ENDERS, J. F. (1939). **Further Studies on the Blood and the Hematopoietic Tissues in Malignant Panleucopenia of Cats.**—*J. exp. Med.* **70.** 557–564. 10 figs. on 2 plates, 1 table, 1 chart. [18 refs.]

During the incubation period and throughout the disease, in malignant panleucopenia of cats, failure of leucopoiesis appears to be the cause of the leucopenia. Inclusion bodies in the primitive blood cells of the marrow suggest a direct action of the virus on these cells. Available data indicate the presence of a mild anaemia due to failure in erythropoiesis. The erythrocytes appear to have an increased fragility and there is a slight increase in the icterus index of the serum. The most conspicuous feature during the course of the disease is a fulminating panleucopenia. During recovery, erythropoiesis does not begin until after the myeloid marrow response has begun to subside.—F. T. BOYLE.

HYDE, R. R. (1940). **An Epidemic of Hydrocephalus in a Group of Experimental Rabbits.**—*Amer. J. Hyg.* Sect. B. **31.** 1–7. 2 figs. on 1 plate, 2 tables.

The features of an outbreak of hydrocephalus among experimental rabbits are recorded. The cause of the outbreak was not ascertained.—F. T. BOYLE.

COLVIN, J. W., & MILLS, C. A. (1939). **Ease of Body Heat Loss and Resistance to Infection.**—*Science.* **90.** 275–276. 1 table. [5 refs.]

When a 10-hour broth culture of a haemolytic streptococcus of standardized virulence was injected into three groups of mice kept at different temperatures it

was found that mice adapted to moist heat (90°F. and 65% relative humidity) exhibited a resistance to the infection only one-quarter as great as litter mates adapted to a cool environment of 65°F.; mice in a control room at 70°–75°F. fell mid-way between those in the hot and cold environment in their resistance. It is concluded that difficulty in loss of body heat and a lowered tissue combustion rate result in a sharply reduced ability to fight infective invasion.—R. ALLCROFT.

VAUGHAN, Janet M., & SAIFI, M. F. (1939). **Haemoglobin Metabolism in Chronic Infections.**—*J. Path. Bact.* **49.** 69–82. 5 figs., 2 tables. [Numerous refs.]

Chronic human infections, such as osteomyelitis and infective endocarditis, are frequently accompanied by an anaemia, which does not respond to treatment with known haemopoietic principles, and in which the red blood corpuscles are normocytic, orthochromic, and of unaltered fragility. The anaemia has been variously ascribed to (a) aplasia of the bone-marrow, (b) increased haemolysis, or (c) imperfect R.B.C. or haemoglobin production. The authors state that they have unpublished evidence that the marrow of patients dying of such infections tends to be hyperplastic, while in the 13 cases discussed in the present paper, plasma bilirubin was within normal limits, and there was no indication of any increase of urobilinogen excretion. In addition, methaemalbumen was not detected in the serum of two of the patients. There was thus no evidence to support (a) or (b). Some indication that a deranged haemoglobin metabolism may be responsible was obtained from determinations of the increased coproporphyrin excretion of three of the patients. The findings of ROBSCHEIT-ROBBINS and WHIPPLE [*V. B.* **8.** 238.], who worked with dogs, are recalled.

—ALASTAIR N. WORDEN.

LAND, E. (1938). Die Interferenz der Wellenlängen zwischen den Bakterien und Blutzellen als Ursache der Entstehung von Infektionskrankheiten und Versuche zu ihrer Bekämpfung. [**Attempts to Control the Interference of the Wave-Lengths between Bacteria and Blood-Cells, as a Cause of Infectious Disease**].—*Zbl. Bakt. I. (Orig.).* **143.** 31–44. 4 figs., 4 tables. [6 refs.]

In a previous paper, L. put forward the view that the outbreak of an infectious disease was the result of interference effects between the electrical radiations emitted by bacteria and blood cells. A method is given for determining bacterial wave-lengths, values for *B. avisepticus* being stated as 227·2 mμ, and for *Str. equi* as 196 mμ. The present paper is concerned mainly with experiments in which attempts are made by electrolytic means to break down bacteria into products from which can be selected those which emit radiations which interfere with the wave-lengths of bacteria. It is claimed that the injection of such substances into animals was entirely successful in preventing such diseases as fowl cholera and strangles. No details are given.

As the article does not lend itself to abstracting, those interested should consult the original.—E. G. WHITE.

MENKIN, V. (1939). Études sur l'inflammation. [**Studies on Inflammation**].—*Rev. Immunol.* **5.** 113–137. 9 figs. [Numerous refs.]

An analysis is made of the histological, biochemical, and immunological aspects of an inflammatory reaction. A diffusible nitrogenous substance, which M. refers to as " leukotaxine ", is liberated in the tissues, possibly as a result of modifications of normal protein katabolism by the irritant. From inflammatory exudates, provoked by chemical, physical and bacterial irritants, " leukotaxine " was isolated in a relatively pure crystalline state, by precipitation with saturated

ammonium sulphate solution, dialysis, and extraction with pyridine and acetone, followed by treatment with butyl alcohol. A study of its physico-chemical characters indicated its relatively simple polypeptide nature. Differential tests are given which distinguish it from histamine. Experiments with rabbits demonstrated the importance of the latter " leukotaxine " as a factor which increases the permeability of capillary walls and causes the migration of polymorphonuclear leucocytes. A description is given of the part played in immunity by the stasis of tissue fluids, as well as by blood and lymph vessels, with reference to the importance of intensity of local reaction as a factor governing bacterial invasion. The cytological picture in the inflamed tissue is determined by the local change in hydrogen-ion concentration, due to a local acidosis resulting from altered carbohydrate metabolism in the circumscribed region, and characterized by increased glycolysis and a fall in the alkaline reserve. A pH of 6·5 or less coincides with the death of all types of leucocytes producing suppuration.—R. O. Muir.

Robertson, H. E. (1939). **Tumor Nomenclature : Suggestions for Its Revision.** —*Amer. J. clin. Path.* **9.** 24–35. [Abst. in *Arch. Path.* **28.** 916, copied *verbatim*].

The present nomenclature of tumors is in serious need of critical review. The terms " benign " and " malignant " might be dropped. The implications carried by the words " benign tumor " are illogical and all " oma " suffixes for these tissue masses should be substituted, when possible, by more appropriate designations. There is no good reason to retain the names " myxoma ", " endothelioma " and " epithelioma ". The tumor called basal cell carcinoma is probably incorrectly labeled. Further simplification and elimination of unsuitable terms in tumour classification should be attempted.

Tannenbaum, A. (1940). **The Initiation and Growth of Tumors. Introduction. I. Effects of Underfeeding.**—*Amer. J. Cancer.* **38.** 335–350. 3 figs., 9 tables. [11 refs.] [Author's summary copied *verbatim*].

(1) The effects of underfeeding on the initiation and growth of induced skin and subcutaneous tumors and spontaneous breast and lung tumors were studied.

(2) Initiation and growth of tumors may be controlled by different factors and should therefore be studied separately.

(3) In underfed animals fewer tumors are formed and at a later time (retarded initiation) than in full-fed animals.

(4) The rate of growth of tumors developing in underfed animals appears to be the same as that of tumors developing in full-fed animals.

(5) The rate of growth of tumors developing in full-fed animals diminishes when these animals are subsequently underfed.

(6) All experimental work dealing with retardation of initiation and growth of tumors must consider the possibility of restricted metabolism and growth of the experimental animals, whether produced primarily by restricted food intake or secondarily by interference with utilization.

Goss, L. J. (1940). **The Incidence and Classification of Avian Tumors.**—*Cornell Vet.* **30.** 75–88. 5 tables. [Numerous refs.]

This paper gives statistics on the P.M. lesions in 7,408 birds of a total of 24,000 from six different flocks. Neoplastic conditions were found at autopsy in 19·5% of the birds. Leucosis of the lymphoid or myeloid type accounted for 991 cases ; most cases occurred in birds under one year old. The next most common tumour was adenocarcinoma of the ovary (67 cases), followed by leiomyoma

(2), fibrosarcoma (8) and a variety of other neoplasms. Adenocarcinoma of the ovary and leiomyoma of the oviduct occurred almost always in birds which were older than one year.

Statistics relating to causes of mortality other than neoplasia are also included in the paper.—E. G. WHITE.

SELBIE, F. R., & MCINTOSH, J. (1939). **Factors Influencing the Infectivity of Fowl Tumours.**—*Brit. J. exp. Path.* **20.** 443–451. 1 fig., 8 tables. [13 refs.] [Authors' summary copied *verbatim*].

The filterability of chemically-induced fowl tumours depends to a great extent on the virulence of the tumours and, conversely, the virulence of such a tumour depends on the activity of the virus.

The virulence of such a tumour, and therefore the activity of the virus, can be increased by methods designed to discourage cellular transmission.

Suspensions of filterable and most non-filterable fowl tumours can be increased in infectivity by proteolytic digestion.

Repeated freezing and thawing by the technique described increases the infectivity of suspensions of the filterable fowl tumours, but annuls the infectivity of the non-filterable tumours.

DMOCHOWSKI, L., & KNOX, R. (1939). **A Complement-Fixing Antigen Common to Filterable and Non-Filterable Tumours of Fowls.**—*Brit. J. exp. Path.* **20.** 466–472. 4 tables. [6 refs.] [Authors' summary copied *verbatim*].

Serum prepared by immunizing a rabbit with $0{\cdot}8\mu$ membrane filtrates of the non-filterable tumour RFD2 gives complement-fixation with active filtrates of Rous and Mill Hill 2 tumours and of fowl- and duck-grown Fujinami tumours.

The reaction has a practical value in making it possible to predict the relative activity of different filtrates before the results of activity tests are available.

Since RFD2 filtrates and heat-inactivated Rous filtrates also give a positive complement-fixation reaction, it is evident that both filterable and non-filterable tumours share a common antigenic factor.

Reasons are given for concluding that the antigenic factor detected by complement-fixation is not predominantly species-specific. It is briefly described as a complement-fixing antigen.

AMIES, C. R., & CARR, J. G. (1939). **Immunological Experiments with Highly Concentrated Suspensions of the Rous I Tumour-Producing Agent.**—*J. Path. Bact.* **49.** 497–513. 8 tables. [17 refs.] [See also *V. B.* **8.** 24].

Concentrated suspension of the tumour-producing fraction was prepared by centrifuging the cell-free tumour extract at pH 5·0–5·5; the sediment was re-suspended and digested with trypsin at pH 9·0, and finally separated by fractional centrifugation. The extreme sensitivity of the tumour agent to oxygen and low temperatures rendered its absolute purification a difficult problem. The apparent antigenic relationship between the tumour agent and the proteins of normal fowl cells was verified by serological tests. The inhibition of the tumour agent by rabbit anti-fowl serum, was shown to be an apparently true antigen-antibody reaction. It is stated that certain fundamental differences exist between the antibodies present in the fowl anti-tumour agent serum and those found in the serum of rabbits immunized with the tumour agent or the normal fowl protein; this was confirmed by absorption tests with normal chick-embryo tissue. Iso-antibodies played no part in the inhibition of the tumour-causing agent by Rous-immune serum from the fowl.—S. G. IYER.

FOULDS, L., & DMOCHOWSKI, L. (1939). **Neutralizing and Complement-Fixing Properties of Antisera Produced by Fractionated Extracts of a Non-Filterable Dibenzanthracene Fowl Sarcoma.**—*Brit. J. exp. Path.* **20.** 458–465. 6 tables. [4 refs.] [Authors' summary copied *verbatim*].

The serum of a rabbit, which received injections of sand and paper-pulp and Berkefeld filtrates of the non-filterable dibenzanthracene fowl sarcoma RFD2, neutralized filtrates of Rous sarcoma No. 1; the neutralizing power was not abolished by absorption with normal fowl tissues. The sera of rabbits which received filtrates of the same tumour prepared by means of collodion membranes having average pore diameters of $0{\cdot}8\mu$ or $0{\cdot}14\mu$ respectively had weak neutralizing properties which were abolished by absorption with normal fowl tissues. The antigen which elicited neutralizing antibodies, other than "fowl" antibodies, was apparently larger than the infective agent of Rous sarcoma.

Complement-fixation tests indicated that RFD2 and Rous sarcoma contained two antigens which were not demonstrated in normal fowl tissues; one antigen was comparable in size with the infective agent of Rous sarcoma and the other was smaller.

The relationship between the neutralizing and the complement-fixing antibodies was not established.

STÄTER, E. J. (1939). Ein sympathogenes Ganglioneurom beim Pferd. [**A Sympathetic Ganglioneuroma in a Horse**].—*Tierärztl. Rdsch.* **45.** 854–857. [14 refs.]

This is the third case on record of a ganglioneuroma in animals. The tumour was 20 cm. in diameter, weighed 2·2 kg., and had its origin close to the anterior mesenteric artery. The horse died following symptoms of colic culminating in volvulus of a portion of the small intestine and haemorrhagic infarction. The neoplasm was identified as a neuroblastoma arising from non-medullated sympathetic nerve cells and fibres and probably related to the solar plexus.—E. G. W.

MOSCHKOWITZ, L., & SPRINZ, H. (1940). **Carcinoma of the Esophagus in an Antelope.**—*Amer. J. Cancer.* **38.** 271–274. 2 figs. [Numerous refs.] [Authors' summary copied *verbatim*].

(1) A study of the literature reveals the rare occurrence of carcinoma of the digestive tract and especially of the esophagus in animals in contradistinction to the findings in man.

(2) A case of a stenosing and ulcerated, hornifying, squamous-cell carcinoma of the esophagus in a Nyala antelope is presented.

KAMBOSSEFF, S. (1937). Hypothetisches über das Inkret der Hassalschen Körper im Zusammenhang mit dem Krebsproblem. [**Hypothetical Correlation of a Secretion of Hassall's Corpuscles and Cancer**].—*Arch. klin. Chir.* **188.** 490–492. [Abst. in *Amer. J. Cancer.* **36.** 136, copied *verbatim.* Signed: Milton J. EISEN].

The author assumes that absence of a thymic secretion is a factor in the etiology of cancer. Thymic atrophy is complete after the fiftieth year of life and it is at this age that malignant disease is most frequent. A specific anti-cancer principle is elaborated in earlier years by Hassall's corpuscles, the characteristic elements of the thymus gland. Absence of this secretion, therefore, gives rise to the endogenous factor responsible for carcinogenesis.

NUTRITION IN RELATION TO DISEASE

I. CREZÉE, B. (1936). Reisziekte (transit tetany) bij pony's. [**Transit Tetany in Ponies**].—*Tijdschr. Diergeneesk.* **63.** 262–263.

II. DE GIER, C. J. (1936). Reisziekte (transit tetany) bij pony's. [**Transit Tetany in Ponies—Replies to Crezée**].—*Ibid.* 613–616.

III. CREZÉE, B. (1936). Reiszeikte (transit tetany) bij pony's. [**Transit Tetany in Ponies**].—*Ibid.* 985–986.

I, II & III. Argument and criticism by two workers concerning a paper published by one of them [see *V. B.* **6.** 364].

DIMOCK, W. W., & ERRINGTON, B. J. (1939). **Incoördination of Equidae: Wobblers.**—*J. Amer. vet. med. Ass.* **95.** 261–267. 9 figs. [2 refs.]

This condition occurs mostly in thoroughbred and saddle horses under two years of age. The symptoms may appear suddenly or their onset may at first be imperceptible. When the limbs are affected the condition is always bilateral. The neck may be affected. Incoordination of the limbs is the chief symptom; cervical changes, such as wasting of the neck muscles often accompanied by pain, may also occur. All attempts to transmit the disease by nerve tissue have failed. No bacteria have been isolated from spinal or synovial fluids and the aetiology is unknown. Degenerative changes of the spinal vertebrae and constriction of the foramina accompanied by degeneration of spinal nerves were found in a number of cases. While these changes are significant, it is not suggested that they are solely responsible for the disease.—R. FISHER.

RAJAGOPALAN, V. R. (1939). **The Role of Mineral Deficiency in Equine Abortion.**—*Indian J. vet. Sci.* **9.** 415–424. 1 table, 2 appendixes. [14 refs.]

During the first half of 1936 a number of abortions occurred in the army stud farm at Ahmednagar. Material from aborting mares and their foetuses was negative for *Salmonella abortus equi*. Out of 12 samples examined, three were positive for *Streptococcus pyogenes* and five for *Bacterium coli*, but these organisms were considered to be secondary invaders. An estimation of the blood calcium of the mares revealed a hypocalcaemia, the calcium content ranging from 7·7–8·7mg. per 100 c.c. From 1929–1934 " churn " brand minerals [no details] were fed and during this period there were hardly any abortions. When these minerals were discontinued in 1934, the number of abortions increased. It was noticed that most of the mares which aborted had been covered by one stallion which was in demand because it was believed that his progeny developed " good bone ". It is suggested that in the progeny of this stallion there was an abnormal drain of calcium from the maternal blood.—R. FISHER.

SCHERMER, S. (1939). Untersuchungen uber die Ursache der in Nordschleswig auftretenden Lecksucht der Rinder. II. Mitteilung. [**Cause of Cattle Pica in Northern Schleswig. II**].—*Arch. wiss. prakt. Tierheilk.* **74.** 201–215. 2 figs. [10 refs.]

" Lecksucht " on moor soils recently brought under cultivation is attributed, not to deficiency of phosphorus or calcium as in some parts of the world, nor to copper deficiency as in certain areas in Holland investigated by SJOLLEMA, but to defective biological value of the proteins of the hay grown.

[Much of the evidence is vague. The disorder is also said to be associated with lowered alkaline reserve of plasma and to respond to supplements of yeast or alcoholic extract of oats; the presumed inadequate character of the plant proteins is speculatively associated with trace element deficiency in the soil].—H. H. GREEN.

EVELETH, M. W., EVELETH, D. F., & WALSH, F. E. (1940). **Hypermagnesemia without Clinical Symptoms in Dairy Cattle.**—*J. Dairy Sci.* **23.** 85–89. 2 tables. [6 refs.]

The reported data indicate that a definite hypermagnesaemia occurred in a herd of Jersey cattle during a period of drought when the grass was extremely dry and sparse. The Ca and inorganic P values remained within normal limits. To rule out the effect of age and gestation the serum Mg of 48 individual mature cows was determined in January, April, July and September. The Mg values for July were much higher than those for the other three months. No interpretation of the significance of the variations in the level of serum Mg is offered.—R. ALLCROFT.

BROWN, G. L., & HARVEY, A. M. (1940). **Effects of Changes in Dietary Calcium on Neuromuscular Transmission.**—*J. Physiol.* **97.** 330–337. 5 figs. [7 refs.]

Experiments carried out on a kid, kept on a diet deficient in Ca, showed that the application of a maximal stimulus to a motor nerve failed to produce a maximal response of the muscle. With repeated stimulation, however, the response of the muscle became greater, and eventually a maximal contraction was obtained. Similar results were obtained with both normal chicks and with chicks fed a Ca-deficient diet, so that the phenomenon appears to be normal in the fowl. In mammals it is not normal and, since it occurred in a kid suffering from Ca deficiency, it may be due to either a lack of Ca which may interfere with the normal movement of K ions at the neuromuscular junction or with acetylcholine liberation.—J. A. NICHOLSON.

DUNLOP, G., INNES, J. R. M., SHEARER, G. D., & WELLS, H. E. (1939). **"Swayback" Studies in North Derbyshire. I.—The Feeding of Copper to Pregnant Ewes in the Control of "Swayback".**—*J. comp. Path.* **52.** 259–265. 2 tables. [3 refs.]

In the North Derbyshire "swayback" area a flock of pregnant ewes was divided into four groups :- (1) control, (2) receiving pure salt licks only, (3) receiving pure salt licks containing 1% Cu (as the sulphate) and (4) receiving salt licks containing 0·3% Cu. The incidence of "swayback" amongst the offspring of the first two groups was 38% and 20% respectively. The third group showed an incidence of only 2·5% and the fourth group 10·5%. Confirmatory evidence is thus obtained of previous work in this country by DUNLOP and WELLS [*V. B.* **9.** 492.] and in Australia by BENNETS and CHAPMAN [*V. B.* **8.** 654.] that the administration of Cu to pregnant ewes is very effective in reducing the incidence of "swayback" in the lamb crop. The Cu-fed groups were further subdivided into smaller units receiving the Cu licks at various periods during pregnancy and at the 1% Cu level the fact that only one case of "swayback" developed in 17 lambs, when the mothers were given the licks only four weeks before parturition, supports the conclusion, derived from the pathological data, that the demyelination process in "swayback" does not begin in the foetal lamb until a relatively late period of intra-uterine life. There was no evidence of actual Cu deficiency *per se* in the control groups. It is suggested that Cu may be a vital factor in normal myelin metabolism, but that its mode of action is at present unknown.—ALFRED EDEN.

VAN DER PLANK, G. M. (1939). Klinische les. Mangaandeficientie bij pluimvee. **[Manganese Deficiency in Poultry].**—*Tijdschr. Diergeneesk.* **66.** 398-402. 1 table.

Supplements of 10% rice bran or a small amount of manganese in the rations prevented slipped tendon in chicks. A good perosis-preventing supplement to

the diet was found to be oats and rice bran, together with a mineral mixture consisting of 78 kg. chalk, 20 kg. salt, 0·6 kg. manganese sulphate, 0·25 kg. copper sulphate and 1·15 kg. iron sulphate. The occurrence of perosis in some broods and not in others on the same farm is probably due to hereditary differences in the need for various food substances.—JAC. JANSEN (UTRECHT).

PICARD, F. H. J., & BAKKER, T. (1939). Onderzoek naar het gehalte aan ijzer en vitamine A in de levers van zilvervossen. **[Iron and Vitamin A Content of the Livers of Silver Foxes].**—*Tijdschr. Diergeneesk.* **66.** 353–356. 2 tables. [1 ref.]

From examination of 21 silver foxes, it was ascertained that the fur of animals whose liver had a high iron content was a healthy deep black colour. That of animals with a low iron content was of bad quality and showed a brown discoloration. The amount of vitamin A in the liver varied, but was, on the whole, small. The authors suggest that foxes are commonly unprovided with sufficient vitamin A.
—JAC JANSEN (UTRECHT).

SCHNEIDER, H., & STEENBOCK, H. (1939). **A Low Phosphorus Diet and the Response of Rats to Vitamin D_2.**—*J. biol. Chem.* **128.** 159–171. 1 fig., 3 tables. [Numerous refs.]

A synthetic diet low in P and free of vitamin D, consisting of 49 parts of cerelose (glucose) 18 parts egg-white, 20 parts cooked starch, 4 parts "vitab", 4 parts P- free salts and 5 parts of cotton-seed oil, produced rickets in rats in from 12–14 days and brought on severe skeletal deformities in six weeks. When supplemented with sufficient P and vitamin D it sufficed as the sole source of nutrients for three successive generations of rats. After four to five weeks on the synthetic diet growth ceased, followed by a rapid decline in weight and subsequent death in the sixth week.

Analyses on various tissues showed a decrease in the P content of blood and bone, but no significant alteration in the P content of other soft tissues such as liver, heart, brain and muscle.

When vitamin D was added to the low P diet, the resultant metaphyseal healing was identical with that observed when like amounts were fed in cereal diets, but a cessation or inhibition in the growth of the rats occurred which did not result under the same circumstances when cereal rachitogenic diets were used. The results of Ca and P balances and tissue analyses suggested that vitamin D induced the utilization of P by bone, thereby depriving the soft tissues of their supply of P, which in turn inhibited growth.—R. ALLCROFT.

I. NORRIS, L. C., & BAUERNFEIND, J. C. (1939). **The Nutritional Deficiency Diseases of Poultry.**—*Harper Adams Util. Poult. J.* **24.** 83–86.

II. CHICHESTER, D. F., RUSSELL, W. C., & HUDSON, C. B. (1938). **Mortality in Poultry Flocks and the Vitamin A Content of the Livers of Pullets and Hens.**—*Poult. Sci.* **17.** 505–510. 1 fig., 1 table. [14 refs.]

I. An article in popular language describing the symptoms in poultry arising from vitamin deficiencies in the ration. The following vitamins are dealt with :– vitamin A (nutritional roup), B (polyneuritis), D (rickets), E (sterility and reproductive failure), G [B_2] (leg paralysis or curly toe paralysis), K (haemorrhages), the anti-dermatosis factor (chick dermatosis), the anti-encephalomalacia factor (nutritional encephalomalacia or crazy chick disease) and the anti-gizzard erosion factor (erosion of the inner lining of the gizzard). Another common deficiency disease of poultry to which brief reference is made is perosis (slipped tendon), arising from a deficiency of manganese in the diet.

II. In view of the postulated relationship between the intake of vitamin A and susceptibility to disease, it was considered possible that a low intake of this factor together with a low liver content might be partly responsible for the high mortality in laying flocks. The number of Moore units per g. of liver was determined in 154 birds which had died from specific diseases and in 69 apparently normal birds. There was no significant relationship between the vitamin A content of the livers of diseased and healthy birds. A disproportionately large number of birds in both groups showed low vitamin A values. Manipulative loss during analysis was excluded, and in the normal group it was known that the intake of vitamin A was adequate. It is concluded that some chickens must utilize vitamin A in such a way that it does not appear in the liver in appreciable amounts and that low liver vitamin A does not indicate an inadequate intake of this factor.—N. J. SCORGIE.

MEUNIER, P., & RAOUL, Y. (1939). Formules et tables de valeur pour le calcul des besoins en vitamines des animaux. [**Formulae and Tables for Calculating Vitamin Requirements in Animals**].—*C. R. Soc. Biol. Paris.* **132.** 259-260. [4 refs.]

Tables are given to enable a ready assessment to be made of the needs of man, and of a number of other mammals, for vitamins A, B_1, C and riboflavine. The data are based upon the authors' previously published formula [*V. B.* **10.** 455].
—ALASTAIR N. WORDEN.

FLORA, C. C., WARD, R. E., BECHDAL, S. I., GUERRANT, N. B., & DUTCHER, R. A. (1939). **Carotene in the Nutrition of Dairy Calves.**—*J. Dairy. Sci.* **22.** 321–328. 2 figs. [15 refs.]

The authors discuss vitamin A deficiency in dairy cows and calves. It follows the feeding of cotton-seed meal and other vitamin-deficient foods and is characterized by slow growth, general unthriftiness, scours, blindness and susceptibility to pneumonia and oedema. Avitaminosis was produced in experimental calves by feeding them on poor quality Timothy hay and a particular grain mixture. When typical symptoms were observed the calves were given fresh carrots, good quality dehydrated alfalfa hay and a commercial carotene concentrate. These products were remarkably effective in correcting the avitaminosis. Carotene dissolved in cotton-seed oil was not nearly as effective.—R. FISHER.

PEARSON, P. B., SCHMIDT, H., & MACKEY, A. K. (1939). **Effect of a Pellagra-Producing Diet on Herbivora.**—*Proc. Soc. exp. Biol., N.Y.* **40.** 423–425. 1 fig. [7 refs.]

Six weanling lambs were given a diet consisting of regenerated cellulose 20, yellow maize 60, peas (*Vigna sinensis*) 10, unpurified casein 9, dicalcium phosphate 1 and NaCl *ad lib.*, together with percomorph oil as a source of vitamins A and D. Good growth resulted for a period of 4–5 weeks, after which the weights of all declined rapidly. To two of the lambs, nicotinic acid was then given by mouth in daily doses equivalent to 5 mg. per kg. body weight, and two others were given vitamin B_1 orally in daily doses equivalent to 50γ per kg. The treated and untreated animals all recovered and resumed normal rates of growth, discontinuation after 44 days of the nicotinic acid and B_1 supplements having had no effect. After the experiments had lasted 130 days a commercial " vitamin-free " casein was substituted for the unpurified casein in the diet of the four lambs which had not received any nicotinic acid supplements, but growth continued unimpaired. The gains in weight are stated to have been comparable with those made by lambs

on a well-balanced fattening ration, and to have ranged from 114–165 g. daily over a 90-day period.—ALASTAIR N. WORDEN.

I. SCHRADER, G. A., & PRICKETT, C. O. (1938). **The Influence of the Diet and Energy Intake upon Acute Vitamin B_1 Deficiency in the Rat.**—*J. Nutrit.* **15.** 607–620. 3 tables. [18 refs.]

II. PRICKETT, C. O., SALMON, W. D., & SCHRADER, G. A. (1939). **Histopathology of the Peripheral Nerves in Acute and Chronic Vitamin B_1 Deficiency in the Rat.**—*Amer. J. Path.* **15.** 251–259. 14 figs. on 3 plates. [14 refs.]

I. Acute vitamin B_1 deficiency, as indicated by the development of neuromuscular symptoms, was produced in rats which were 23–26 days of age at the commencement of the experimental periods. The basal vitamin B_1 deficient diet employed contained constant amounts of protein, minerals and agar per calorie, but the source and quantity of the carbohydrate and fatty constituents were varied. Both *ad lib.* and restricted methods of feeding were adopted.

The percentages of animals which developed symptoms of an acute deficiency showed a wide variation with the different diets, but with two diets in which carbohydrate and fat each supplied approximately one-half of the non-protein source of energy, 90% or more animals were so affected. The method of feeding appeared to exert less effect than the constitution of the basal diet, and sex did not appear to bear any relationship to the production of the deficient state.

II. Two series of experiments are described, in both of which the sciatic nerves of rats maintained on vitamin B_1 deficient diets were studied by the polarized light method. In the first series, a total of 139 animals, including 39 controls on an adequate stock diet, was used, and different levels of a B_1 deficient ration were fed, as described in I. Eight of the group were allowed to become moribund before destruction, but the remaining animals on the deficient ration were killed at an average time of 2½ days after the development of neuromuscular symptoms. Examination by polarized light revealed only a slight degree of oedema and some Wallerian degeneration in the nerve fibres, more marked in those cases which had been allowed to become moribund. These changes were not detected in Sudan III preparations.

The second series involved 40 animals, which were allowed to develop symptoms of acute B_1 deficiency, and then maintained alive for varying periods by the administration of small amounts of crystalline aneurin in aqueous solution. Polarized light examination of the nerve fibres revealed changes of an oedematous type, which were much more marked than in the acute deficiency. Completely isotropic fibres were noted in severe cases.—ALASTAIR N. WORDEN.

MACLEAN, D. L., SHEPPARD, Margaret, & MCHENRY, E. W. (1939). **Tissue Changes in Ascorbic Acid Deficient Guinea-Pigs.**—*Brit. J. exp. Path.* **20.** 451–457. 7 figs. on 4 plates. [13 refs.] [Authors' summary copied *verbatim*].

Tissue changes resulting from an acute deficiency of ascorbic acid in guinea-pigs, using the paired feeding technique so that the variable factor of inanition may be controlled, show that the principal abnormalities are in the bones and teeth. In both these cases the vitamin deficiency causes a failure in those special cells which are concerned with the formation of calcific tissue. No evidence has been secured to support the jellation theory. Characteristic changes in other tissues have not been obtained. The inanition which is coincident with the development of ascorbic acid deficiency is not responsible for any of the observed histological changes.

VERSTRAETE, A. (1939). Het vitamine C vraagstuk bij dieren. **[Vitamin C Requirements of Animals]**.—*Vlaam. Diergeneesk. Tijdschr.* **8.** 165–178. 3 tables. [7 refs.] [English, French and German summaries].

V. was unable to produce any clinical symptoms in dogs by feeding them on a diet deficient in vitamin C, although there was a decrease in the amount of vitamin C excreted in the urine. When large amounts of ascorbic acid were injected into healthy dogs there was no corresponding increase in its excretion. —A. W. MÖLLER.

PUBLIC HEALTH

RASCH, K. (1938). Ueber die amtliche tierärztliche Milchuntersuchung, **[Official Veterinary Milk Control (Germany)]**.—*Berl. tierärztl. Wschr.* March 4th. 130–133. 1 chart.

According to the German regulations since January 1936, at least one milk sample for every 1,000 inhabitants has to be examined once a year. R. reports on the results obtained in lower Silesia in the course of this work.

Farmers owning TB. infected herds were required to rid them of the affected cows; the time periods allowed for this are given. 138 herds were found infected with TB. at the first examination, but in 100 of these herds the milk was uninfected at the second examination the following year. Eighteen herds had to undergo a third examination, five were only free after four examinations, and fifteen were still under observation. All the examinations were carried out during 1936 and 1937. At the first test of 4,340 samples R. found an incidence of 5% TB., 11% *Brucella abortus* infection and 2% streptococcal infection.

R. emphasizes the importance of all officials concerned in milk control (laboratory workers, veterinary officers and police) working together so that this regulation may lead to the production of safe milk.—M. F. BENJAMIN.

BILAL. (1939). Etudes sur les laits d'Ankara au point de vue de Brucella Bang et de la tuberculose. **[Study of Milk in Ankara from the Point of View of Brucellosis and Tuberculosis]**.—*Arch. internat. Brucelloses.* **2.** No. 2. 53–54.

A short report dealing with the bacteriological examination of milk sold in Ankara. In an examination of 54 samples *Br. abortus* was not found, but three organisms were isolated which were agglutinated by *Br. abortus* serum. G. pig inoculation showed that five samples contained tubercle bacilli, whilst in 29 other samples there were pathogenic organisms, both aerobes and anaerobes, which caused death in the g. pigs. It is stated that milk sold in Ankara is probably safer and cleaner than milk sold in provincial villages.—N. J. SCORGIE.

BRYAN, C. S. (1939). **A Microscopic Test for Quality Milk**.—*Proc. U.S. Live Stock Sanit. Ass., 1938.* pp. 122–131. 8 tables.

B. claims that by means of a direct microscopic test of milk samples incubated at 37°C. for at least 12 hours it is possible to detect 99% of cows infected with streptococcal mastitis. He states that the blood-agar plate method detects only 90% of infected cows, and physical examination of the udder only 61%. The results of an experimental infection test indicate that the portal of entry of *Str. agalactiae* into the udder is the teat canal. Data are presented to show that the presence of *Str.a.* in a sample of milk greatly reduces the quality of the milk as determined by the methylene-blue reductase test. B. also discusses details of dairy hygiene and the handling of milk. As a result of monthly tests undertaken

with a view to encouraging clean milk production, it is apparent that dirty utensils, poor cooling and dirty cows or barns are the major sources of contamination of milk.—N. J. SCORGIE.

BROOKS, P. B. (1939). **A Study of Milkborne Epidemics.**—*J. Milk Technol.* **2.** 168–174. 2 figs.

During the period 1917–1938, 151 milk-borne epidemics were recorded in the State of New York, as against none in New York City. No raw milk other than a relatively small amount of certified milk is sold in the city. Of the diseases involved, typhoid and paratyphoid fever caused the largest number of outbreaks; there were only two-thirds as many outbreaks of streptococcal infections—scarlet fever, sore throat, etc.—but the total number of cases of these conditions was nearly five times as great. The source of infection of eight of the outbreaks was not determined, but the others originated from the farm providing the milk. Some description is given of the outbreaks.—F. T. BOYLE.

KELLER, H., & MÖLLER, H. (1939). Untersuchungen über den Nachweis der Fleischfäulnis nach der Methode von Walkiewicz. [**Demonstration of Meat Putrefaction by the Method of Walkiewicz**].—*Z. Fleisch- u. Milchhyg.* **49.** 141–143.

A few drops of an extract of the meat to be tested are dropped on a 1 : 1,000 solution of perchloride of mercury, and when there is putrefaction a greyish violet cloud develops for a few seconds, sinking to the bottom and causing opalescence on being stirred up. The authors examined the value of this method on a large number of meat samples from cattle, calves, pigs and horses, for use as an easy means of testing the normal keeping quality of meat and making sure that putrefaction has not already set in. They conclude that the method is valuable for the detection of the early stages of putrefaction in the musculature of healthy cattle and calves with normal meat acidity. Putrefaction could be detected one or two days earlier than with Eber's test for ammonia. The authors state that the Walkiewicz test provides a good criterion of the keeping quality of meat, and that an indication that putrefaction has started is given long before this can be found by general inspection. The method is not suitable for examination of the muscular tissue of pigs or horses. Musculature interspersed with much connective tissue, fat and blood cannot be used, as non-specific positive reactions occur because the pH is high.—M. F. BENJAMIN.

THERAPEUTICS

BODDIE, G. F. (1939). **Recent Advances in Therapeutic Agents for Veterinary Use.**—*Vet. Rec.* **51.** 1237–1249. [Numerous refs.]

The items considered here are vitamin A, vitamin D, urinary antiseptics and the sulphanilamide group.

The work of MCCARRISON (1931) regarding the association between vitamin A supplies and the formation of urinary calculi in cattle in India is dealt with, and it is suggested that the factors mentioned by McCarrison may be responsible for chronic bovine haematuria in Gt. Britain. Additional factors in the aetiology of urinary calculi are dealt with, and it is suggested that urinary calculus formation in young rams may be due to factors similar to those which induce their formation in recumbent human subjects.

Attention is drawn to the suggestion that where ordinary doses of vitamin D fail to give satisfactory results, massive doses of high potency preparations may do so.

Dealing with urinary antiseptics, the author discusses mandelic acid and outlines the conditions under which it is active.

The sulphanilamide group is dealt with under headings of general pharmacology, toxic effects and veterinary application. Attention is drawn to the rapidity of excretion of these drugs and to the necessity of obtaining and maintaining a sufficient concentration in the blood. The findings of several workers in animal disease conditions are recorded and B. states that he has found proseptasine and M & B 693 of value in bovine pneumonia, and that cases of " transit fever " with symptoms of broncho-pneumonia seem to have benefited from such treatment.—W. J. Ironside.

Litchfield, J. T., Jr., White, H. J., & Marshall, E. K., Jr. (1939). **The Experimental Basis for a Method for the Quantitative Evaluation of the Effectiveness of Chemotherapeutic Agents against Streptococcus Infection in Mice.**—*J. Pharmacol.* **67.** 437–453. 3 figs., 3 tables. [18 refs.]

The incorporation of sulphanilamide in the food of mice appears to be the most satisfactory method of maintaining an almost constant blood concentration of the drug. The mouse eats with sufficient regularity and frequency to ensure the continuous presence of sulphanilamide in the intestine. The daily drug intake per mouse can be converted into average blood concentration by using a predetermined factor. There is no significant difference between pre-feeding and immediate treatment with sulphanilamide, but if treatment is delayed until four hours after infection there is a significant decrease in the number of mice which survive.

A method is outlined for the quantitative evaluation of the effectiveness of chemotherapeutic agents against streptococcus infections in mice. Comparisons of different drugs, or of the same drug under different conditions, can be made by determining the daily drug intake necessary to produce the same response (50% survival). This median survival dose (SD50) can be converted to a median survival blood concentration (SBC50) by the use of an appropriate factor.

—J. M. Robson.

Fleming, A. (1940). **Observations on the Bacteriostatic Action of Sulphanilamide and M & B 693 and on the Influence Thereon of Bacteria and Peptone.**—*J. Path. Bact.* **50.** 69-81. 3 figs., 1 plate, 6 tables. [8 refs.]

Sulphanilamide and sulphapyridine have a powerful bacteriostatic action on small numbers of *Streptococcus pyogenes*, but the action is negligible on massive implants. Sulphanilamide injected intravenously into a rabbit confers immediately on the blood an increased bacteriostatic power. Thick suspensions of bacteria in combination with sulphanilamide or sulphapyridine give off substances which inhibit the bacteriostatic action of the chemical, but on dilution the bacteriostatic power returns. Peptone added to sulphanilamide has a similar effect. Dead streptococci added to human blood favour the growth of small implants of the same streptococci.—J. M. Robson.

Gaisford, W. F., Evans, G. M., & Whitelaw, W. (1939). **Parenteral Therapy with M. & B. 693 Soluble.**—*Lancet.* **237.** 69–72. 4 figs. [6 refs.]

Anon. (1939). **An Alternative Route [M. & B. 693].**—*Ibid.* 84. [1 ref.]

Marshall, E. K., & Long, P. H. (1939). **The Intravenous Use of Sodium Sulfapyridine.**—*J. Amer. med. Ass.* **112.** 1671–1675. 1 fig., 3 tables. [7 refs.]

Parenteral administration of sodium sulphapyridine is desirable in certain

cases of pneumonia, *viz*, when sulphapyridine cannot be taken by the mouth, when an adequate concentration is not reached in the blood following oral administration, or when a maximum effect must be reached as rapidly as possible, *i.e.* in severe cases. The American investigators have found the intravenous method most satisfactory and have given the drug by this route to many patients and observed no ill effects, except that the injection sometimes caused vomiting. G. and his colleagues found the intramuscular method of injection more satisfactory as it is less liable to cause reaction and vomiting and gives an equally satisfactory concentration in the blood. The drug is given deep into the gluteal muscle, 4–6 injections of 3 c.c. (33% solution) being given at four-hourly intervals.—J. M. R.

IL'INOV, S. P. (1938). Opyt lecheniya infektsionnoĭ plevro-pneĭmonii koz novarsenolom. [**Treatment of Pleuro-Pneumonia of Goats with Novarsenol**].—*Trud. Uzbek. nauchn.-issled. vet. Stan., Tashkent.* **9.** 109-117. 4 figs. [16 refs.] [English summary].

Forty-five adult goats and 13 kids affected with infectious pleuro-pneumonia were treated with novarsenol. Twenty-one animals were given the remedy once, 26 twice and 11 three times at varying intervals. Five of the treated animals died, but only three (5·2%) from the disease. The death rate of controls was 69% (11 died out of 16).

Three treated animals were killed and examined P.M. 16 and 50 days after the administration of novarsenol, and it was found that there was almost complete restitution of the affected tissue.—E. MARTIN.

KRANEVFLD, F. C., & UMBOH, T. E. W. (1939). Experimenten over het gefractionneerd toedienen van naganol bij de behandeling van surra. [**Fractional-Dose Naganol Treatment of Surra**].—*Ned.-ind. Bl. Diergeneesk.* **51.** 371–383. 1 table, 2 charts. [4 refs.] [English and German summaries]. [Abst. from authors' English summary].

Under conditions which were kept as far as possible uniform (experimental animals from the same breeder, of practically the same age and weight, all of one strain obtained from a single ancestor, infected with the same number of trypanosomes and showing practically identical courses of infection) the therapeutic effect of definite doses of naganol in g. pigs affected with surra showed differences. There is, therefore, an individual difference, which must be taken into account in experiments concerning naganol resistance, etc.

It was found by experiments with g. pigs that the therapeutic effect of a certain dose of naganol is less if the dose is given in fractional parts with a day's interval between injections. Again, the greater number of times the dose is subdivided the less the number of cures.

It can be shown in horses that a constituent of the naganol, or a trypanocidal product thereof, is excreted in the urine shortly after injection. When g. pigs were injected, at a time when there were many trypanosomes in the peripheral blood, with 5 c.c. of such a urine specimen passed between 5 and 37 hours after an intravenous injection of naganol, the parasites disappeared rapidly from the blood and did not reappear for several days, sometimes as many as 33.

Normal urine specimens of two out of the three horses used in the experiments proved also to have an effect on the trypanosomes *in vivo*, but to a much smaller degree. The cause of this could not be attributed to the pH of the urine of the animals nor to their urea content.

I. Bogoroditskiĭ, A. V., & Lavrent'ev, P. A. (1935). Ispytanie antimosana pri lechenii teĭlerioza v Sredneĭ Azii. [**Experiments with Antimosan Therapy of Theileriasis in Central Asia**].—*Bull. Uzbek. nauchn.-issled. vet. Inst., Tashkent.* No. 1–2. pp. 17–25. 7 tables. [4 refs.]

II. Bogoroditskiĭ, A. V., Bernadskaya, Z. M., & Lavrent'ev, P. A. (1935). Nablyudeniya nad deĭstviem mysh'yakovistykh vann v kontsentratsii 0·15% i 0·16% na kleshcheĭ H.i B.i zabolevaniya teĭleriozom i piroplazmozom v usloviyakh Sredneĭ Azii. [**Effect of Arsenic Solutions on *Hyalomma* and *Boophilus* and on Theileriasis in Central Asia**].—*Ibid.* pp. 26–33. 4 tables. [3 refs.]

I. Sixteen animals naturally infected with *Th. annulata* were treated with intravenous and subcutaneous injections of sodium antimosan. The drug was not toxic. One animal died; the remainder was considered to have benefited. In untreated affected animals on the same two farms mortality was 70% and 61·3% respectively.

II. The authors found that for six-day dipping to protect cattle against *Boophilus* and *Hyalomma* ticks, a minimum sodium arsenite concentration of 0·16% was required. It is recommended that dipping should begin early in the season before the ticks appear in great numbers.—E. Martin.

Pulvertaft, R. J. V., Lemon, G. C., & Walker, J. W. (1939). **Atmospheric and Surface Sterilisation by Aerosols.**—*Lancet.* **236.** 443-446. 4 figs. [3 refs.]

The method of sterilization by aerosols consists essentially of extremely fine atomization of bactericidal solutions carried out by an apparatus known as the "Phantomyst". The mist produced is highly persistent, and in an unventilated room definite traces remain in suspension after 48 hours. Since the order of the size of the particles is 5μ, a small total amount of antiseptic solution has a large surface area, so that 10 c.c. of an antiseptic will sterilize a room of 2,000 cu. ft. capacity (the room is tested for asepsis by exposing culture plates). Each particle in the mist or aerosol has an initial concentration of antiseptic comparable to that of the solution nebulized, so that the efficacy does not depend upon total atmospheric concentration, but upon the nature of the surface of the particle, and whether the particle makes contact with the bacillus. Thus, a clear distinction must be made between the effects of volatile antiseptics and of aerosols. The total atmospheric concentration of antiseptic is important when the effect on the human being and on culture media is considered. Among the antiseptics tried, resorcinol and chloramine-T do not affect the respiratory tract or inhibit the growth of surviving bacteria when plates are exposed to them at the necessary concentrations, but they do produce a visible mist and slight smell, both of which are entirely innocuous, and at present no invisible and odourless aerosol has been found. Both these aerosols have proved completely effective against the organisms used, *viz.*, *Chromobact. prodigiosum*, *Staphylococcus albus*, *Streptococcus haemolyticus*, *Pneumococcus*, and *Corynebacterium diphtheriae*.

Sterilization of surfaces by aerosols is possible within limits: non-absorbent surfaces alone are affected, and under certain described conditions a new mixture referred to as "G.M.2." was found to destroy completely the organisms named above and also *Vibrio cholerae*, *Pasteurella pestis*, *Salmonella typhi* and *Bact. coli*. This treatment did not entirely destroy spore-bearing organisms such as *B. subtilis* but was 50-70% effective.

An obvious application of the use of aerosols is in the sterilization of media and vaccine rooms.—R. Allcroft.

BEST, C. H. (1938). **Heparin and Thrombosis.**—*Brit. med. J.* November 12th. 997–981. 6 figs., 1 table. [Numerous refs.]

Heparin has been found to be abundant in ox liver, lung and skeletal muscle and it is now possible to prepare a stable crystalline barium salt of uniform potency at reasonable cost. Heparin acts as an antiprothrombase and antithrombase and can be titrated against thrombokinase. It can be given intravenously or subcutaneously and is absorbed rapidly from the tissue spaces. A single dose prolongs the clotting time for as much as 24 hours, recovery taking place within 12–24 hours. Following experimental damage to a vein or coronary artery, the healing of the vessel takes place without thrombus formation if heparin is administered continuously. Protamine can be used to neutralize the action of heparin. The heparin content of the blood rises during anaphylactic shock, thus explaining the increase in clotting time found in this condition. The mast cells are probably the site of formation or storage of heparin. Heparin will prove of great value in the prevention of post-operative embolism, but it must not be given earlier than two to three hours after the conclusion of the operation.—J. A. NICHOLSON.

STEWART, M. A. (1939). **A New Prophylaxis for Wound Myiasis in Domestic Animals.**—*J. econ. Ent.* **32.** 404–407. [5 refs.]

A mixture having a melting point of 149·2°F. and composed of 25% acid-free, dehydrated Stockholm pine-tar oil, 12·5% " amorphous paraffin wax " and 62·5% viscous oil [details of the nature of the oil are given], affords efficient protection against myiasis and stimulates tissue repair in wounds. The dressing should be applied over a tow dressing when a sinus is present, and where no sinus is present, it should be applied after the wound has been dried with petroleum ether or tannic acid. Its prophylactic efficiency is based upon both chemical repellent action and mechanical protection, while permitting wound drainage. When bone oil was substituted for pine-tar oil in the mixture, the period of protection was reduced by about 14 days. Bone oil alone prevented both drainage and tissue repair in wounds.—W. MOORE.

STRONG, L. C. (1940). **The Problems of Tissue Specificity and the Chemotherapy of Cancer.**—*Amer. J. Cancer.* **38.** 243–252. 8 charts. [9 refs.] [Author's summary copied *verbatim*].

(1) The spontaneous tumors of 6 distinctive genetic strains of mice grow at approximately the same rate.

(2) There is approximately the same graded sequence of histologic type in the spontaneous tumors of these 6 strains.

(3) Minor differences in histologic features of the spontaneous tumours do, however, occur.

(4) Approximately the same effect can be produced by heptyl aldehyde and methyl salicylate on spontaneous tumors in mice belonging to the different genetic strains.

(5) The phenomenon of " tumor specificity ", as expressed by the spontaneous tumors that arise in a given genetic strain of mice does not, apparently, interfere with the effect on cancer of pure chemicals added to the diet.

RIDER, D. L. (1940). **An Experiment in Feeding Wheat-Germ Oil Prepared by Ether Extraction.**—*Amer. J. Cancer.* **38.** 275–276. 1 table. [4 refs.] [Author's summary copied *verbatim*].

Forty-five young adult white rats were fed an average of 3 c.c. daily of wheat-germ oil prepared by ether extraction of raw wheat germ for periods varying from 81 days to 247 days without developing any tumors intra-abdominally or elsewhere.

Six similar rats receiving a stock diet and 3 c.c. of refined "Vio-Bin wheat-germ oil" per day for 351 days did not develop tumors. They appeared normal in every way and were quite healthy. Five control rats on a stock diet for 351 days remained normal. Eight rats fed on raw wheat germ and just enough stock diet to keep them alive showed no pathological changes after 120 days. They were then kept on stock diet till the 251st day, thus serving as additional controls. They developed no tumors.

Rats receiving wheat-germ oil gained weight faster and appeared healthier than similar rats on stock diets alone.

POISONS AND POISONING

GORTNER, R. A., Jr., & LEWIS, H. B. (1939). **The Retention and Excretion of Selenium after the Administration of Sodium Selenite to White Rats.**—*J. Pharmacol.* **67.** 358–364. 3 tables. [10 refs.] [Authors' summary copied *verbatim*].

Young white rats were fed synthetic diets containing sodium selenite at levels of 25, 35 and 50 p.p.m. of selenium. The selenium content of the combined liver, kidneys and spleen of individual rats fed sodium selenite over prolonged periods ranged from 0·03 to 0·17 mgm. or from 0·4 to 2·8 per cent. of the selenium ingested. No correlation between the selenium concentration of the diet and that of the organs could be demonstrated. Ingested selenium appeared to be rapidly eliminated by the organism of the rat.

From 20 to 50 per cent. of orally ingested selenium was excreted in the feces. No relation between the selenium content of the feces and the concentration of selenium in the diets could be demonstrated. It is believed that the greater part of the fecal selenium originates from dietary selenium which has escaped absorption.

FORBES, J. C., & OUTHOUSE, E. L. (1940). **Studies on the Mechanism of the Protective Action of Xanthine against Carbon Tetrachloride Poisoning.**—*J. Pharmacol.* **68.** 185–193. 4 tables. [10 refs.] [Authors' summary copied *verbatim*].

1. The subcutaneous injection into rats of substances known to exert a protective action against chloroform or carbon tetrachloride, such as xanthine, india ink, tricalcium phosphate and sodium ricinoleate all cause a marked drop in the serum esterase concentration.

2. The injection of inactive substances such as sodium chloride, peptone and sodium bicarbonate does not cause a drop in the concentration of serum esterase.

3. Control animals poisoned with carbon tetrachloride show a marked rise in the concentration of serum esterase while animals previously protected with xanthine do not exhibit this rise.

4. Administration of a high fat diet to rats, a condition known to increase an animal's susceptibility to carbon tetrachloride and chloroform, causes a marked rise in the serum esterase value. However, the rise in the serum esterase does not seem to bear any definite relation to the lipid content of the liver.

5. It is suggested that the drop in serum esterase as well as the increased resistance of the liver to these poisons is associated with a repair process taking place at the site of injection, this repair being manifested either by a walling off of the injected material, as in the case of xanthine, or by replacement of destroyed tissue, as in the case of sodium ricinoleate.

MYERS, G. N. (1939). **The Influence of Emulsions of Olive Oil Upon the Biological Actions of Alkaloids.**—*J. Hyg., Camb.* **39.** 705–715. 1 fig., 7 tables. [6 refs.]

When certain alkaloidal salts of arecoline, pilocarpine, atropine, morphine, diacetylmorphine or strychnine are mixed with an olive oil emulsion in a fine state of subdivision, allowed to stand for periods up to 24 hours at 37·5°C., and then injected into animals, their biological actions do not appear to be modified in any way. This suggests that the droplets of the emulsion have not the power to adsorb alkaloidal salts at their surfaces. It is inferred that the use of such an emulsion would not be of value for the treatment of poisoning by alkaloids.

—J. M. ROBSON.

SCHWARTE, L. H., EVELETH, D. F., & BIESTER, H. E. (1939). **Studies on the So-Called Corn Stalk Poisoning in Cattle.**—*Vet. Med.* **34.** 648–651. 1 table.

During some seasons in Iowa when drought conditions prevent the normal growth of maize, certain unidentified substances may develop in the maize plant which are highly toxic for cattle, but apparently harmless to horses [see *V. B.* **7.** 623, and **8.** 596]. Commonly the P.M. findings are suggestive of a septicaemic cause but no virus or pathogenic bacteria can be demonstrated. Hydrocyanic acid, and potassium nitrate and nitrite have been eliminated as possible causes of the illness. The causal factor appears to be labile, since the corn stalks seem to lose their toxicity after being cut. Data obtained from the chemical examination of the blood of affected and healthy animals fed on affected corn stalks, usually showed the serum Ca to be raised in the affected and lowered in the healthy animals ; in experimentally fed animals there was also a decrease in serum Mg. This is in contrast to poisoning in horses by mouldy maize where there is hypocalcaemia and hypermagnesaemia.—N. J. SCORGIE.

SINEV, A. V. (1939). Intoksikatsiya gossypolom-glukozidom khlopkovogo zhmykha. [**Poisoning of Cattle by Gossypol through Feeding with Cotton-Seed Oil Cake**].—*Sovyet. Vet.* No. 7. pp. 72–74. [1 ref.]

The increase in cotton production in Russia has brought about an increased use of cotton-seed oil cake and cotton-seed meal as fodder, and numerous cases of gossypol poisoning have been reported.

After a comprehensive description of the symptomatology, pathology, diagnosis and treatment of the condition, S. expresses the opinion that, despite their toxic properties, cotton-seed products are most valuable feeds because of their high protein and fat content. He recommends fermentation, boiling or parboiling as a means of detoxicating these products. [He is apparently unaware of the experience obtained with this fodder in the U.S.A. MUENSCHER (*V. B.* **10.** 156.) says that cotton plants from certain areas have a high gossypol content and are therefore potentially poisonous.—Ed.]—E. MARTIN.

DOBRYNINA, V. I. (1939). O deĭstvii gorchaka na domashnikh zhivotnykh. [**The Effect of *Centaurea picris* on Domestic Animals**].—*Sovyet. Vet.* No. 6. pp. 59–60.

Centaurea picris [Russian knapweed], picked in flower, was fed to two 2-year-old colts and two sheep of the same age, the amounts fed not being stated. The sheep remained healthy.

Both colts died with identical clinical symptoms and lesions. D. draws attention to the similarity of these symptoms to the clinical appearance of equine encephalomyelitis. [STEYN in his text-book " The Toxicology of Plants in South Africa " (pp. 392. Johannesburg : Central News Agency. 1934.) states that *C.p.* is poisonous for sheep].—E. MARTIN.

BARR, C. G., REUSZER, H. W., & THORP, F., Jr. (1939). **The Chemical Composition of Suckleya suckleyana.**—*Science.* **90.** 497–498. [1 ref.]

It has been shown that *S.s.* contains HCN in amounts toxic for cattle, sheep, rabbits and g. pigs. In studying the factors influencing HCN formation, the authors found a close relationship between the HCN and the reducing sugar content of the plant. It was also noted that with increase in age of the plant, there was marked reduction of protein nitrogen, accompanied by an equally rapid formation of HCN. It is suggested that, following the exhaustion of available nitrates, synthesized proteins may be digested and the nitrogen constituent of the molecule then used in the formation of glucosides which yield HCN upon hydrolysis. The coincident increase of reducing sugars may stimulate the synthesis of the cyanogenetic glucoside.—N. J. SCORGIE.

BÁRDOSI, Z. (1939). Adatok a gyöngyvirág és a leanderlevél mérgező hatásához. [**Toxicity of Lily of the Valley and Oleander Leaves for Fowls**].—*Thesis, Budapest.* pp. 14. [Germany summary].

Leaves of *Nerium oleander* (Ceylon rose) and flowers, leaves and stems of *Convallaria majalis* (lily of the valley) were found to be poisonous for geese, ducks and hens.

Geese were killed within 24 hours by 6 g. of the previous season's oleander leaves. The lethal dose for ducks was 3 g., death occurring within 12 hours. 15 g. of new leaves were lethal for hens [no time given]. The symptoms were apathy, weakness, vomiting, diarrhoea, accelerated pulse, aphonia, deterioration of sight and muscular co-ordination, and, in some cases, paralysis of the wings.

Lily of the valley flowers were lethal to geese in doses of 13 g. and to ducks in doses of 12 g., while in hens 30 g. produced only a mild enteritis.

With the exception of geese, which ate oleander leaves spontaneously, the birds rejected the plants and the toxic material had to be administered by compulsory feeding.—E. MARTIN.

PHYSIOLOGY

ROUMAILLAC, P. (1939). Anatomie topographique des viscères thoraciques et abdominaux du veau. Modifications entrainées par la croissance. [**Topographic Anatomy of the Thorax and Abdomen of Calves. Changes Caused by Growth**].—*Thesis, Toulouse.* pp. 94. 15 figs. [17 refs.]

The development of the thoracic and abdominal viscera was studied in nine calves from birth until five months of age. In order to determine the exact site of the organs during life, the animals were anaesthetized and then fixed in a standing position before bleeding and the tissues and organs were fixed by embalming.

R. states that the most noticeable feature of the thoracic cavity in the calf is the large size of the thymus, which extends up the neck. In the abdominal cavity the development of the rumen during the first five months causes the left kidney to move to the right, while the left lobe of the liver decreases in size. At birth the abomasum is larger in proportion to the rest of the stomach than in older animals.
—A. T. PHILLIPSON.

HOFF, H. E., SMITH, P. K., & WINKLER, A. W. (1939). **The Relation of Blood Pressure and Concentration in Serum of Potassium, Calcium and Magnesium.**—*Amer. J. Physiol.* **127.** 722–730. 7 figs., 1 table. [14 refs.]

Potassium chloride, calcium chloride and magnesium sulphate in isotonic solution were injected intravenously into 24 dogs and 11 cats at a slow, uniform

rate until death occurred. Blood pressure showed only minor changes during potassium and calcium injections until terminal cardiac failure occurred, then an abrupt fall to zero occurred. Magnesium produced an immediate fall in pressure and after artificial respiration had been provided the fall continued gradually and progressively until death. Magnesium produced marked vasodilation due partly to a change in the concentration of the circulating magnesium and partly to the actual presence of an elevated concentration. Calcium and potassium had no marked effect in this respect. Magnesium provoked an immediate rise in skin temperature while calcium and potassium did not.—H. V. HUGHES.

BERNÁT, J. (1939). A ló vérének nátriumtartalma. [**Sodium Content of Horse Blood**].—*Thesis, Budapest.* pp. 8. 2 tables. [Numerous refs.] [German summary].

The average sodium content of horse whole blood was found to be 219·6 mg. % and that of plasma and serum 333·6 mg. %. The sodium content of horse blood corpuscles averaged 31·2 mg. %.—E. MARTIN.

KIKUTI, S. (1939). **Blood Picture in Healthy Foals, with Special Reference to Leucocytes.**—*Jap. J. vet. Sci.* **1.** 413–425. 1 table, 4 graphs. [11 refs.] [In Japanese: abst. from English summary].

K. examined the blood of 54 foals varying in age from 5–275 days. The number of erythrocytes was generally found to be between 7 and 8 millions and the number of leucocytes between 12,000 and 14,000 per c.mm. The blood cells showed a gradual decrease in number a few days after birth. The percentages of the varieties of leucocytes were estimated to be as follows :– neutrophiles between 22 and 75, lymphocytes between 20 and 71, and eosinophiles between 0·3 and 1·7. There was no close relationship between the age and the number of eosinophiles, but neutrophiles decreased rapidly after the 7th day. At the 54th day there were more lymphocytes than neutrophiles. Mononuclears and transitional varieties were few during the early days of life.—H. V. HUGHES.

BLOUNT, W. P. (1939). **Normal Blood Cells in the Bovine.**—*Vet. J.* **95.** 222–231. 1 table.

Forty bovine animals, 14 of which were calves aged from one day to three months, were examined. The average size of the red blood corpuscles was found to be 6·5μ, and there was anisocytosis with a range of 4μ to 8μ. Regenerative changes noted were few, in fact the nature of the erythrocyte in the young calf showed little change from that of the adult animal. The granules of the polymorph were difficult to stain, but with Pappenheim's panoptic method, the nucleus stained bright purple and could easily be differentiated from the royal blue of the eosinophile. The size of the granular leucocytes varied from 11μ to 12·5μ, the eosinophiles being the largest. The lymphocytes varied from 7·9μ to 13·7μ; all are round cells with a pale blue cytoplasm devoid of granules, and purple nuclei. The monocyte was the largest hyaline leucocyte encountered.—C. W. OTTAWAY.

PENDERI, G. (1939). Egyes háziákkatok bőrének klórtartalma. [**Chlorine Content of the Skin of Certain Domestic Animals**].—*Thesis, Budapest.* pp. 7. [Numerous refs.] [German summary].

Samples of skin taken from ten horses, ten cows, ten pigs and ten dogs were examined for the chlorine content. The average values found were 0·86% in horses, 0·85% in cows, 0·60% in pigs and 0·66% in dogs. Sex, age and condition are stated to have no influence on the chlorine content of the skin; but individual deviations occur and may be due to differences in feeding.—E. MARTIN.

I. Barcroft, J., Barron, D. H., Cowie, A. T., & Forsham, P. H. (1940). **The Oxygen Supply of the Foetal Brain of the Sheep and the Effect of Asphyxia on Foetal Respiratory Movement.**—*J. Physiol.* **97.** 338–346. 2 figs., 2 tables. [8 refs.]

II. Barcroft, J., Kennedy, J. A., & Mason, M. F. (1940). **Oxygen in the Blood of the Umbilical Vessels of the Sheep.**—*Ibid.* 347–356. 2 figs., 3 tables. [15 refs.]

I. The percentage saturation of carotid blood of the foetus with oxygen was found to be over 60 up to the 139th day of pregnancy. A sharp fall occurred towards the end of pregnancy owing both to an increased oxygen capacity of the blood and to a lowered oxygen content. The blood leaving the brain, taken from the superior longitudinal sinus, also showed a marked fall in saturation during the last days of pregnancy. The two series of analyses were taken from different subjects, but on comparison, the difference between the carotid and sinus blood was found throughout pregnancy to average 2·7 vols. %, no difference being found between the middle and later stages of pregnancy. The reduced level of oxygen (effected by pinching the umbilical cord) necessary to release the brain from the subcortical inhibition which is present after the 60th day of pregnancy, also varied and tended to rise until the 110th day and then fall until full term, indicating that the inhibitory centre in the foetus becomes increasingly more resistant to asphyxial conditions in the latter stages. Comparisons between the carotid blood and that of the umbilical arteries and veins showed that the composition of the carotid blood is always intermediate between that of the umbilical vein and artery, except towards the end of pregnancy when it is nearer to that in the umbilical vein.

II. The object of this paper was to give figures for the saturation and content of the blood in the umbilical vessels, on which more confidence could be placed than on those previously published, as the conditions under which the blood was obtained were more rigidly controlled. Manipulation of the umbilical cord especially during the later stages of pregnancy, causes occlusion of the uterine vessels, as occurs sometimes at birth. Elaborate precautions were taken to see that the cord was maintained in its natural environment and that it suffered the minimum of mechanical interference beyond the prick of a sharp needle. Duplicate figures were obtained for different sheep at the same stage of pregnancy up to about 130 days, but after that period the results were more variable. The percentage saturation of the blood from the umbilical vein was high, in the region of 70; it reached its peak about the 75th–100th day and then dropped during the last week of pregnancy, the figures becoming irregular. The changes in the umbilical artery were greater than in the umbilical vein.—A. T. Phillipson.

Weber, H. H. (1939). Muskeleiweisskörper und Eigenschaften des Muskels. **[Muscle Protein and the Properties of Muscles].**—*Tierärztl. Mitt.* **20.** 649–651. 2 figs., 2 tables. [1 ref.]

When a living tissue performs work, the metabolism of the protein it contains undergoes change. This is particularly so in muscles. Recent work has shown that four types of proteins occur in muscle, *viz*, albumin, in the form of myogen and myoalbumin, globulin, which probably consists of several closely related proteins, myosin and stroma protein. Of these, myosin is the only protein affected during muscular contraction, the others taking no part in it. Muscular contraction depends on the chemical reaction between myosin and the fluid surrounding it. It is not known exactly what these chemical changes are, but it is certain that the solubility of myosin alters during muscular contraction. [The interest of this work lies in its connection with myoglobinuria.]—J. A. Nicholson.

SZŐKE, D. (1938). Adatok a szarvasmarha mellékveséjének, szemlencséjének, csarnokvizének és üvegtestének ascorbinsavtartalmáról. [**Data on the Ascorbic Acid Content of the Adrenal Gland, Crystalline Lens, Aqueous Humour and Vitreous Humour in Cattle**].—*Thesis, Budapest.* pp. 9. 4 tables, 2 charts. [Numerous refs.] [German summary].

The adrenal glands and eyes of four bulls, four cows, four oxen, eight unweaned calves and 18 foetuses (nine male and nine female) were examined for their vitamin C content, which was found to vary in accordance with sex and age.

Average values for adrenal glands in mg. per 100 g. were :– 145·24 in bulls, 134·52 in cows, 135·42 in oxen, 165·52 in male and 153·91 in female calves, 87·79 in male and 64·49 in female foetuses.

Figures for the lens, aqueous and vitreous humours are given in detail, the averages being :– lens, 17·2 in adult cattle, 58·37 in calves, and 29·84 in foetuses ; aqueous humour, 17·07 in adults, 52·0 in calves, and 33·12 in foetuses ; vitreous humour, 14·42 in adults, 33·64 in calves, and 13·51 in foetuses.—E. MARTIN.

I. KAPP, E. M. (1939). **Spectrographic Observations on Urinary Porphyrins : The Nature of a Combined Form of Coproporphyrin Found in Urine.**—*Brit. J. exp. Path.* **20.** 33–41. 4 figs., 1 table. [7 refs.]

II. RIMINGTON, C. (1939). **Porphyrins and Their Relation to the Metabolism of Blood Pigments.**—*Proc. R. Soc. Med.* **32.** 1268–1275. 10 figs. [Numerous refs.]

I. By means of spectrographic studies supporting evidence was found for the view that a combined form of coproporphyrin occurring in human urine is a Zn compound. The absorption spectra of both Zn coproporphyrin and free coproporphyrin in the ultra-violet region are recorded and discussed.

I. This discussion is divided into a consideration of the chemistry of the porphyrins, their distribution in nature, and of pathological conditions in which porphyrin excretion is markedly increased. The more important porphyrins found in nature are protoporphyrin (including its relation to haematin and the respiratory enzymes), coproporphyrins I and III, iroporphyrins I and III and bilirubin. The distribution throughout the plant and animal kingdoms is very wide. The formation of bile pigment from haemoglobin breakdown and the mechanism involved are discussed. A hypothesis to explain the increase in series III porphyrin excretion is given. There is a short discussion of pathological conditions in which there is increase of porphyrin excretion in man, including congenital porphyry and acute idiopathic porphyry, although as yet the nature of the constitutional metabolic disorders responsible for the causation of these diseases is but imperfectly understood.—ALFRED EDEN.

TEORELL, T. (1940). **On the Primary Acidity of the Gastric Juice.**—*J. Physiol.* **97.** 308–315. 2 tables. [15 refs.]

In order to measure the primary acidity of the gastric juice, some means of preventing the secondary reduction which lowers its value must be employed. T. rejects the theories of others regarding the mechanisms which effect this secondary reduction and, from previous work of his own [(1939). *J. gen. Physiol.* **23.** 263.], puts forward "the diffusion theory". He found that the loss of acidity is proportional to the prevailing hydrogen-ion concentration in accordance with the laws of diffusion. In order to measure the primary acidity, the pH of the gastric juice must be stabilized either by dilution or else by producing a suitable buffer into the stomach. The latter method was employed ; the buffer used was a 0·2–0·3 M solution of glycocol, which is only slightly permeable through the

gastric mucosa. The amount of HCl secreted is determined by titrating the buffer back to the pH of the original juice-free buffer. The primary acidity produced by histamine in cats, measured in this way, was found to be considerably higher than the total titratable acidity found during normal gastric analysis.—A. T. P.

MONROE, C. F., & PERKINS, A. E. (1939). **A Study of the pH Values of the Ingesta of the Bovine Rumen.**—*J. Dairy Sci.* **22.** 983–991. 2 figs., 5 tables. [4 refs.]

Two animals, an 18-month-old steer and a jersey cow in her first lactation, were each provided with a permanent rumen fistula which was closed by a rubber plug and opened only for sampling. Six samples of rumen contents were taken every time, one from the anterior, one from the middle and one from the posterior regions of the dorsal and ventral sacs. It was found that the ventral sac had a slightly higher pH than the dorsal sac, and that the reaction of the anterior region of the rumen was slightly lower than that of the posterior region.

At first, samples were taken at 1 p.m. only and many determinations were made while the animals were on different rations. On a ration of grain and hay the average pH was 7·01 (variation 6·54–7·4); on a ration of grain, hay and corn silage it was 6·95 (variation 6·74–7·20). An increase of the silage ration and the addition of limestone did not alter the range of pH. On pasture, however, the pH was more acid, the average for blue grass pasture being 6·47 (variation 5·91–6·92) and on alfalfa pasture 6·66 (variation 6·55–6·85).

The most interesting results were obtained when 2-hour samples were taken throughout 12-hour periods. At 5 a.m., before the early morning feed, the pH was at its highest, being over 7; after the feed it fell to below 6·5 reaching the lowest point at 9 a.m. and then rose again until 3 p.m. when the afternoon feed was given which again caused a fall. At pasture the readings were more constant, but were lower in the afternoon than in the morning. The pH of the rumen contents of animals slaughtered after 12–18 hours fast was over 7 in all cases.—A. T. P.

POCHON, J. (1938). Remarques sur la digestion de la cellulose par voie bactérienne, chez les mammifères. [**Digestion of Cellulose by Bacteria in Mammals**].—*Trav. Sta. zool. Wimereux.* **13.** 575–585. 1 table. [8 refs.]

The symbiotic type of the cellulolytic organisms of the intestinal tract of mammals, *e.g. Bacillus cellulosae dissolvens* and *Plectridium cellulolyticium* are strict anaerobes, fermenting only cellulose, and cultivable artificially only with the addition of intestinal extract to the medium. This latter requirement is shown to be to some extent specific: in the case of organisms obtained from the camel and the deer, extract from the specific host species was necessary; bovine extract, however, sufficed for the cultivation of *Pl. cellulolyticium* obtained from cattle, sheep and the Indian buffalo.

The saprophytic types of cellulolytic organisms from the soil differ in being typically aerobic and not specific either in their fermentative capacity or cultural requirements.

On progressive sub-culture of the symbiotic types from the intestinal tract, mutation occurred with the development of strains resembling the saprophytic types and this is considered to suggest that the intestinal forms are derived by a process of adaptation from the ubiquitous soil organisms ingested.

The production of glucose in the course of the fermentation has been demonstrated where the reaction of the medium has been changed from pH 7·5 to pH 4·0, which occurs *in vivo* in the passage of ingesta from the rumen to the abomasum.

—E. O. LONGLEY.

FLOCK, E. V., HESTER, H. R., & BOLLMAN, J. L. (1939). **Phospholipid Changes during the Production of Fatty Livers in Geese.**—*J. biol. Chem.* **128.** 153–157. 1 table. [16 refs.]

Studies were made of the partition of liver fat in normal geese and in geese in which fatty livers had been induced by the feeding of an excessive carbohydrate diet. The great increase in total lipides of the liver, as a result of the feeding, was found to be chiefly in an increased amount of neutral fat. The phospholipide fraction, expressed in relation to the total amount per 100 g. of goose live weight, was unchanged or only slightly increased. Decreases in the iodine numbers of the fatty acids of the lipides studied occurred in this order :– phospholipides, neutral fat of the livers and mesenteric fat. The constant disparity in the degree of saturation of the fat in the liver and in the depots in the geese which form large quantities of fat from carbohydrate, suggests that the liver takes an active part in the process, and is not merely flooded passively with fat from the depots.—A. EDEN.

I. DUCKWORTH, J., & GODDEN, W. (1940). **The Partition of Serum Calcium about the Time of Parturition in the Dairy Cow.**—*J. Dairy Res.* **11.** 9–14. 1 table. [4 refs.]

II. GODDEN, W., & DUCKWORTH, J. (1940). **A Long-Term Study of the Partition of Serum Calcium in Ayrshire Cows.**—*Ibid.* 15–21. 1 fig., 6 tables. [10 refs.]

I. Data are presented giving the variations in the total Ca, Ca ion, ultrafiltrable Ca complex, non-ultrafiltrable Ca complex, protein-bound Ca, inorganic P, and serum phosphatase of ten dairy cows at normal parturition. The results are discussed and an interpretation of the variations is given.

II. Values for the different Ca fractions obtained from 14 Ayrshire cows at six intervals during a period of 3½ years are presented. The following averages are reported :– 10–12% Ca^{++}, 40–45% U.Ca C., about 20% N.U.Ca C., and 50–53% ultrafiltrable Ca.—R. ALLCROFT.

HALLER, E. (1939). Beitrag zur Aus- und Rückbildung des Corpus luteums und der Follikel in den Ovarien gravider Stuten. [**Development and Regression of the Corpus Luteum and Ovarian Follicle in Pregnant Mares.**]—*Wien. tierärztl. Mschr.* **26.** 474–475.

Ovaries from 23 pregnant mares were examined macro- and microscopically ; the length of pregnancy was determined by foetal measurements. The time during pregnancy at which regression of the corpus luteum occurred varied considerably in individual animals, being, in some cases, as early as 4½ months, though more usually between 6½ and 8½ months.

Normal follicles were observed in mares pregnant for 6–8 months, and in some cases atretic or cystic follicles were found together with normal follicles in the same ovary. The ovaries alter in shape during pregnancy, being kidney-shaped in the early stages and spindle-shaped in the later stages. The left ovary in these mares was, as a rule, larger than the right.—J. A. NICHOLSON.

PIERRE. (1937). Quelques notions d'endocrinologie appliquée a la médecine vétérinaire. [**Veterinary Endocrinology (Review)**].—*Rev. Méd. vét., Toulouse.* **89.** 641–650. [See also *V. B.* **9.** 120 and 741 ; **10.** 143].

This is the first of a series of review articles dealing with endocrinology, in which the aim is stated to be a correlation of the physiology of hormones with various pathological syndromes occurring in veterinary medicine. In this article P. reviews briefly the history, mode of action, pathology, methods of study and the therapeutic indications of the internal secretions (hormones).—N. J. SCORGIE.

TECHNIQUE AND APPARATUS

LAIGRET, J., & AUBURTIN, P. (1938). Coloration rapide des rickettsias par la thionine. **[Rapid Staining of Rickettsiae with Thionin].**—*Bull. Soc. Path. exot.* **31.** 790–791.

The thionin stain recommended is prepared by precipitating a saturated aqueous solution with 10% caustic soda, washing the precipitate and dissolving it in 2% phenolized thionine. Smears are fixed in alcohol, stained for 30–50 seconds with thionin, dehydrated rapidly with alcohol, and passed through xylol to cedar-wood oil. It is important not to overstain. Rickettsia are coloured dark purple against the pale violet of the cell cytoplasm. This method is said to give better results than Giemsa or Castenada.—U. F. RICHARDSON.

CARLETON, H. M., & LEACH, E. H. (1939). **An Improved Method for Flattening Out Paraffin Sections.**—*J. Path. Bact.* **49.** 572–576. 4 figs. on 1 plate.

The method involves the substitution of diacetin for the distilled water usually used and is said to yield improved results when fixation is inappropriate or when P.M. changes are present. A disadvantage is that the paraffin block cannot be cooled by running water or ice, and sections do not adhere to the slide unless coated with celloidin.—F. T. BOYLE.

METZGER, H. J., BEAUDETTE, F. R., & STOKES, Freida R. (1939). **The Use of the Incubating Egg as a Differential Medium.**—*J. Amer. vet. med. Ass.* **95.** 158. [1 ref.]

Inoculation with *Br. abortus* in sterile saline or milk, of the chorio-allantoic membrane through the natural air sac, on the tenth day of incubation, was followed by the recovery of the organism from the chorio-allantois, liver, spleen, and brain even when only approximately six organisms were used. Similar inoculation of 50,000 *Streptococcus agalactiae* gave negative results. Mixed cultures of both organisms yielded pure brucella cultures in most embryos that lived for five days after inoculation. Milk from an udder infected with both organisms, was inoculated into eggs, seed material being taken from both cream and sediment. *Br. abortus* was recovered in pure culture from about half of the eggs. In another experiment, 10 out of 11 eggs proved positive when cultured on bacto tryptose agar containing crystal violet (1:700,000). The authors advocate the use of this method for the study of the occurrence of *Br. abortus* in milk.—S. J. GILBERT.

PENNA, H. A. (1939). **New Technique for Aseptic Removal of Chick Embryo from Egg.**—*Amer. J. trop. Med.* **19.** 589–592. 3 figs. [2 refs.]

A small electric motor with a spring support for holding the egg in position, and an oxy-acetylene torch with a small flame are required for this work. The essential feature of this technique consists in burning the shell at the centre and along the margin of the air sac, previously outlined in pencil during " candling ", and then removing the piece of shell so as to expose the air sac membrane which is torn with sterile forceps for the withdrawal of the embryo.

This method was devised to eliminate the need for filtration, in the preparation of yellow fever vaccine with bacteria-free virus.—S. G. IYER.

LINDBERGH, C. A. (1939). **A Culture Flask for the Circulation of a Large Quantity of Fluid Medium.**—*J. exp. med.* **70.** 231–238. 3 figs. [1 ref.]

Details are given of an apparatus for tissue culture which enables a large number of tissue fragments to be cultivated in a single flask and in a thin layer of

well-oxygenated and constantly circulating medium. The apparatus consists of a flask containing two chambers, one above the other, the lower acting as the culture chamber and the upper as the reservoir of the medium. There are two openings to the culture chamber, one for the insertion of the tissue, the other for the introduction of the " control gas ", which oxygenates the fluid, regulates the pH, and actuates the circulation. The reservoir chamber has one opening which serves for the introduction of the medium and also as an outlet for the gas. An ingenious arrangement of three tubes is incorporated within the flask. When in use, the flask is connected indirectly to a cylinder of " control gas ", and, by means of the three tubes inside, a constant circulation of media between the two chambers is maintained.—J. R. LAWSON.

I. TURNER, T. B., & FLEMING, W. L. (1939). **Prolonged Maintenance of Spirochetes and Filtrable Viruses in the Frozen State.**—*J. exp. Med.* **70.** 629–636. 2 tables. [9 refs.]

II. TURNER, T. B., & BRAYTON, Nancy L. (1939). **Factors Influencing the Survival of Spirochetes in the Frozen State.**—*Ibid.* 639–650. 4 tables. [7 refs.]

I. Certain spirochaetes and filtrable viruses were tested for virulence after prolonged storage at –78°C. Strains of *Treponema pallidum* and *T. pertenue* were highly pathogenic for rabbits after three years' storage, and with one exception the treponemas were numerous and actively motile. Spirochaetes of relapsing fever were actively motile and virulent for mice after six to twelve months' storage. *Leptospira icterohaemorrhagiae* showed activity after five, six and ten months, and *Spirillum muris* was virulent for mice after a year, although the incubation period was slightly prolonged. The viruses of human influenza (PR8 strain), meningo-pneumonitis (a condition which occurs in human beings in California) and lymphogranuloma inguinale were fatal to mice, the first two after three years and the last after ten months.

II. Titration tests were made to determine the factors injurious to relapsing fever spirochaetes in the frozen state. After freezing and thawing, the proportion of motile organisms varied, but no close correlation between motility and virulence for mice was noted. There was a decrease in titre and the incubation period was longer than normal. Virulence decreased after repeated freezing and thawing, irrespective of the duration of storage, and was destroyed after four re-freezings. After storage at –12° and –20°C. there was a gradual decrease in virulence, and infectivity was markedly reduced after six weeks. Optimum conditions for the preservation of spirochaetes in the frozen state are presumed to be :– rapid cooling, storage at –78°C. and rapid thawing. Storage at –20°C. or higher and slow thawing are very harmful.—M. L. BINGHAM.

GRABAR, P., & DE LOUEIRO, J. A. (1939). Sur la préparation de membranes ultrafiltrantes. [**The Preparation of Filter Membranes**].—*Ann. Inst. Pasteur.* **63.** 159-189. 3 figs., 14 tables. [16 refs.]

The structure of filter membranes, prepared from nitrocellulose by evaporation, depends to a great extent upon the composition of the mixture at the time of the formation of the gel ; this mixture in turn depends upon the composition of the primary solution. The ratio of gel-producer to nitrocellulose in the initial solution governs the degree of swelling of the gel and hence the resultant membrane.

Ultrafilter membranes were prepared from a system comprising three factors, *viz*, nitrocellulose, gel-producer and solvent. In all systems employed propyl alcohol was selected as the gel-producer. The employment of acetone, ethyl acetate and methyl acetate as solvents covered the entire range of porosities. The

intermediate porosities could be obtained either by varying the ratio of solvent to gel-producer in the initial solutions, or by mixing in different proportions two solutions containing solvents of two opposite types, or by adding a slightly volatile solvent to a system in which the solvent produced swelling of the gel. Homogeneous membranes without " macroscopic polygonal structures " were obtained by avoiding very volatile solvents and by diminishing the rate of evaporation by mechanical means.—E. C. HULSE.

HENCHOZ, E. (1939). Contribution à l'étude des transfusions sanguines chez les bovins. [**Blood Transfusion in Cattle**].—*Schweiz. Arch. Tierheilk.* **81.** 133–147 and 196–207. 2 tables. [Numerous refs.] [In French].

Blood transfusion has not yet been applied to any great extent in the treatment of animal disease. H. discusses agglutination and haemolysis and the blood groups in human beings. Blood groups have been described as occurring in cattle [see *V. B.* **10.** 23], but opinions on the dangers of blood transfusion vary somewhat. Erythrocyte agglutinating power is but little developed in animals, and H. suggests that most of the reactions following transfusion are possibly due to differences in the proteins injected. The position with regard to anaphylaxis in blood transfusion in animals is obscure, but desensitization may be practised. Other possible accidents include the formation of emboli or the transmission of disease such as tuberculosis or brucellosis.

H. states that the technique used consists of bleeding with a fleam into 5% citrate solution. Descriptions of five transfusion cases are given. Four out of ten transfusions were followed by more or less violent reactions, but only in animals which were given repeated transfusions. One case proved fatal. 200–300 c.c. are now given, followed by double this amount after 15 minutes. Injections should be made slowly into the jugular vein.—S. J. GILBERT.

MISCELLANEOUS

CABOT, D. A. E. (1939). **The National Veterinary Service [United Kingdom].** – *Vet. Rec.* **51.** 1030–1034.

An address to the Annual Congress of the National Veterinary Medical Association of Great Britain and Northern Ireland by the Chief Veterinary Officer, Ministry of Agriculture and Fisheries. A brief review was given of the past, the circumstances that led to the inauguration of a national veterinary service and the plans for the immediate future. Certain outstanding factors in British veterinary history which influenced future progress were considered, *viz*, (a) the introduction of sheep-pox in 1848 and cattle-plague in 1865 and the consequent legislation, (b) the passing of the Diseases of Animals Act in 1894 and (c) the report of the Cattle Diseases Sub-Committee of the Economic Advisory Council. It was pointed out that this committee dealt with a group of diseases which had remained outside the provisions of existing legislation, *viz*, bovine tuberculosis, contagious abortion, mastitis, and Johne's disease. An early result of the report was the introduction of the Tuberculosis (Attested Herds) Schemes, which were voluntary and marked a new departure in the control of disease. Next came reference to the passing of the Agriculture Act of 1937, in which power was given to improve the health of the herds and flocks of the country and to set up a national veterinary service. The implications of the Bill were discussed and the work of the central department during the first year of its existence outlined.

Regarding the immediate future reference was made to the continuance of

the TB. eradication scheme, to the extension of the facilities available to the poultry industry and to the proposed introduction of a voluntary scheme to control abortion in attested herds. Finally information was given regarding the panels of part-time veterinary inspectors, set up to undertake duties under the various Acts and Orders and under the schemes of eradication of disease in the herds in their own districts.—J. C. WALLACE.

BRADFIELD, E. W. C. (1938). **An Indian Medical Review.** pp. iii+658. Delhi: Manager of Publications. [8vo].

Of interest to readers of this *Bulletin* are chapter VIII, "Medical Research in India" (pp. 192–224) and to some extent chapter X, "Pharmacy and Drugs Control" (pp. 246–255).

—. (1939). **Central Veterinary Research Institute for East Africa.**—*Vet. Rec.* **51.** 1326–1328.

A central veterinary research institute for East Africa situated at Kabete, Kenya Colony, was inaugurated in September, 1939. This institute with its five professional research workers will be grafted on to the existing laboratory at Kabete which already has 15 professional workers on its staff. Towards the capital expenditure involved the Colonial Development Fund has allocated a grant of £5,430. The Standing Veterinary Research Committee of the Conference of Governors of British East African Territories has approved a programme of work for the station. This includes research upon virus diseases, particularly rinderpest, the action of dipping fluids, helminth infections of sheep, *Theileria* species, and deficiency diseases. The hope is expressed that since the committee is primarily concerned with the basic problems of animal health in relation to environment, later research may be undertaken in connection with problems of this nature.—H. V. HUGHES.

LAWRENCE, D. A. (1938). **Veterinary Research in Rhodesia Today.**—*Proc. Rhod. sci. Ass.* **36.** 79–83.

A general account of research undertaken in Southern Rhodesia.—J. C. W.

I. HAGAN, W. A. (1939). **Veterinary Education with Special Reference to Finance and Personnel.**—*Cornell Vet.* **29.** 1–10.

II. MURRAY, C. (1939). **Veterinary Education—National Need.**—*Ibid.* 53–60. 3 tables.

I. Following the War of 1914–18 the number of veterinary students in the United States was very low, but during the last five years there has been an unprecedented enrolment into the colleges. In 1938 the number of students in 12 colleges in the United States and Canada was 2,339. Since most colleges are supported by the states in which they are situated the first consideration is given to residents in the state and thus those who reside in states where there is no college are at a disadvantage. Whilst several states have agitated for new veterinary schools H. considers that no state should establish a school unless it is prepared to make an original investment of $500,000 and to provide $100,000 annually towards its upkeep. He considers a federal subsidy to be the only solution to the problem of financing veterinary education. He urges this, however, not in order to offer opportunities of professional education to a greater number of persons, but to provide a better education for the better student. Progress in veterinary education depends upon the ability of administrators to pick out and encourage the type of student who is prepared to undertake specialized training in order to become a good teacher or research worker.

11. The state of the livestock industry is not the sole influence governing the demand for veterinary services. This demand increases more rapidly than does the increase in the value of the livestock industry, for the increase in human population is accompanied by increasing problems in disease control due to more complex commercial activities, contamination of the soil, demand for more and better services and for a better and more wholesome food supply.

It is likely that the number of graduates in the United States in 1940 will be 400, which is slightly more than the estimated figure based on American-Canadian human mortality figures and having regard to anticipated expansion. The number engaged in post-graduate work is small and it is evident that the colleges as now organized cannot produce an adequate number of properly trained men to meet the demand for such work.—H. V. Hughes.

Watkins, C. V. (1938). **Rationalization and the Incidence of Animal Diseases.** —*Agr. Progr.* **15.** 163–170.

After the war of 1914–18 many people whose training had been industrial entered agriculture and attempted to apply mass production methods to agriculture. Almost all of the methods used caused greater or lesser departures from the hitherto natural rate of production and these increased rates of production have not always been met with an adequate supply of all the necessary food factors. The evidence as regards animals is to be found in an increased mortality rate and in what appears to be an entirely new set of animal diseases. Diseases occurring in the poultry and pig industries are discussed. W. considers that the control of poultry diseases should be through compulsory recording of all losses by poultry breeders with a proviso that a proportion of birds which die or are culled be examined by a recognized laboratory. A system of recording and proper marking of sows and young pigs would, it is considered, enable unhealthy breeding stock to be more surely traced.—F. T. Boyle.

McKim, O. E. (1939). **The Rôle of the Veterinary Service in Modern Warfare.** —*J. Amer. vet. med. Ass.* **95.** 15-21. [6 refs.]

The theme of the article is that the next big war will be won by the side which has the most efficient animal transport and, by implication, the most efficient veterinary service. The author asserts that mechanical transport failed at critical periods in the recent Ethiopian, Spanish and China campaigns. Senior commanders at the recent U.S.A. manoeuvres concluded that the horse continues to be the best means of transport and reconnaissance in the forward battle areas. The replacement of casualties will be difficult because of the decrease in the world supply of horses and so there will be greater need for salvage than there has formerly been, and thus a greater demand on the veterinary service.

The duties of the U.S.A. Army Veterinary Service include inspection of the food for the troops as well as that for the animals, and instances are cited of financial and other benefits which are said to have accrued from that arrangement. Not the least part of their responsibility is to control disease which might otherwise be spread by captured animals or those belonging to the inhabitants of the country in which war is being waged.—G. Williamson.

I. —. (1939). **Air Raid Precautions for Animals.** *A.R.P. Handbook No. 12.* pp. iv+28. 4 figs. London: H.M. Stat. Off. [1st Edit.] [8vo] [3d.]

II. —. (1939). **Wartime Aids for all Animal Owners. Issued by the National A.R.P. Animals Committee, under the Auspices of the Home Office.** pp. 28. 1 fig., 3 tables. London: National A.R.P. Animals Committee. [8vo] [4d.]

III. ——. (1939). **The Effects of War Gases on Animals.**—*Vet. Rec.* **51.** 1102–1106. 1 table.

I. This small booklet forms one of a series of official handbooks issued by the Air Raid Precautions Department of the Home Office.

It deals very briefly with the protection of buildings and animals against high explosive and incendiary bombs, the effects of the main war " gases " on animals, and protective and first-aid measures which can be adopted. Directions are given for the destruction of the various animals.

[It is a matter of regret that the Home Office have been content to issue such an attenuated booklet. It does not compare favourably with the majority of the other handbooks in the series, especially those dealing with the human subject. The sales have reached a surprisingly high level. The importance of the subject warrants the production of a further addition to the series, analogous to that on " Medical Treatment of Gas Casualties " (Handbook no. 8)].

II. This booklet gives particulars of the air raid precaution services for animals, evolved by the veterinary profession and the animal welfare societies, at the request of the Home Office.

It elaborates many of the subjects dealt with in the handbook described in I. It advises on measures to be adopted with regard to working horses, and includes a chapter on the wartime feeding of dogs and cats.

III. An account is given of those war " gasses " commonly dealt with in air raid precaution lectures in Britain, with special reference to their effects on animals, together with protective and first aid measures. The salient facts are also presented in tabular form.

Tear and nasal irritant " gases " do not affect animals to any appreciable or serious extent. The blister " gases " do not cause blistering of the skin in animals. Under certain circumstances, the liquid " gas " may cause inflammatory lesions resulting in necrosis and ulceration.—H. E. Bywater.

I. Madsen, H. (1939). **Does the rabbit chew the cud?**—*Nature, Lond.* **143.** 981–982.

II. Taylor, E. L. (1939). **Does the rabbit chew the cud?**—*Ibid.* **143.** 982–983.

III. Eden, A. (1940). **Coprophagy in the Rabbit.**—*Ibid.* **145.** 36–37. [3 refs.]

I. M. provides evidence in support of observations recorded by Morot as long ago as 1882, that rabbits produce two types of faeces—the familiar dry pellets passed during the day, and a soft, mucus-coated variety, which is passed nocturnally—and that the latter type is prehended direct from the anus, to be swallowed without mastication and to form the well-known pellets found in rabbits' stomachs. A rabbit provided with a wooden collar and placed in a cage, the floor of which possessed a wide mesh, produced the two types of faeces " in a day-night rhythm ". Indications that the food passed twice through the intestines were obtained from nine other rabbits, which were fed simultaneously with fig seeds, and killed at varying intervals. In one of these animals, killed at 3 a.m., the soft pellets were found in both stomach and rectum, and contained in each case specimens of *Passalurus ambiguus*, a common parasite of the caecum and colon.

II. Six rabbits were fasted for 48 hours, and three of them were then placed in rubber bags so that only their heads remained free. All the rabbits were then given food *ad lib.*, and on the following day were killed and autopsied. Pellets were present in the stomachs of the control rabbits, but not in those of the rabbits which had been tied in the bags. Further confirmation of faecal origin of the stomach pellets was obtained from their relatively high content of coccidial oocysts, and from experimental feeding with *Lycopodium* spores.

III. The information derived from I and II was applied to studies on the

fate of ingested copper in the rabbit. Earlier experiments had shown that the elimination of ingested copper was spread over several weeks, in one case five weeks having elapsed before 97% of a test dose of 50 mg. of copper, given in the form of sulphate and dried on to the food, was recovered. In a rabbit provided with a wooden collar sufficiently large to prohibit direct prehension from the anus, 96% of a similar dose of 50 mg. of copper was recovered from the faeces in four days. Alternate collaring and uncollaring of another rabbit which had received 50 mg. of copper gave further indication of the great increase in the faecal dry matter, and in the excretion of copper, which occurred when this peculiar form of coprophagy was prevented. With the diet employed, there was a far higher total ash content in the "night faeces" than in those passed during the day. It is calculated that from 50 to over 80% of the total matter passed through the anus is normally reingested.—ALASTAIR N. WORDEN.

—. (1939). **Report of the Committee on Public Relations. [Amer. Vet. Med. Ass.]**—*J. Amer. vet. med. Ass.* **94.** 299-308.

This committee deals chiefly with publicity; it has worked through the American Foundation for Animal Health and state veterinary associations. Attention has been drawn to veterinary science through the press and radio. The American Foundation of Animal Health receives from veterinarians articles and news items for editing, and has supplied copy on animal health subjects and prepared a number of radio talks. Arrangements were also made for veterinarians to address medical students on the scope and value of veterinary services.

The committee also dealt with the position of the veterinary surgeon in relation to public health work, and discussed the question of State Veterinary Service and private practice.—J. C. WALLACE.

OFFICIAL AND OTHER REPORTS

GREAT BRITAIN (1940). **Twenty-Ninth Report of the Development Commissioners being for the year ended the 31st March, 1939.** pp. 133. London: H.M. Stat. Off. [8vo] [2s.]

Of the sum placed in 1938–1939 at the disposal of the Commissioners, £47,295 was expended on veterinary research institutes and organizations by annual or special grants, and £52,941 on animal genetics, animal nutrition, dairy research, helminthology, pig husbandry, poultry research and animal breeding. The veterinary institutes were:– the Institute of Animal Pathology, Cambridge; the Research Institute of the Royal Veterinary College, London; the Foot and Mouth Disease Research Committee, and the Animal Diseases Research Association of Scotland. Short accounts are given of the administration and finance of the research institutes. In addition to the sums mentioned above, grants are made for advisory work, including veterinary science, at various colleges and universities.

For research and administrative expenses a grant of £66,190 was made to the Agricultural Research Council; of this, £48,205 was allocated to the Compton Field Station for capital expenditure and maintenance.

A grant of £3,000 was made for extension of the Hygiene Department of the Royal (Dick) Veterinary College, Edinburgh.

The investigations in progress at the institutes supported by the grants of the Development Fund are described in reports issued by the Departments and reviewed in reports of the Agricultural Research Council.

One studentship for research in animal health and two scholarships tenable at the Royal Veterinary College, London, were awarded.—J. C. WALLACE.

AUSTRALIA, NEW SOUTH WALES. (1939). **Live Stock Diseases Report (No. 14) recording Control Work during the Year ended 30th June, 1938.** [BELSCHNER, H. G.] pp. 31. 2 tables. Sydney: Government Printer. [8vo].

DIAGNOSIS

Many thousands of complement-fixation tests have been made for CONTAGIOUS BOVINE PLEURO-PNEUMONIA following an outbreak in a hitherto free area.

RESEARCH

CONTAGIOUS MASTITIS.—Serological studies are proceeding. Therapeutic treatment with entozon has given promising results.

SHEEP BLOWFLY.—Investigations showed that boracic acid in the drinking water conferred no protection against strike and that glycerine diborate dressing protected sheep for a limited period. The Mules (breech wrinkle removal) operation undoubtedly renders sheep less susceptible to blowfly attack, but for other reasons connected with the welfare of the sheep industry, the investigators do not consider that the operation should be adopted as a routine in sheep management.

ANTHRAX.—It was found in experiments carried out that anthrax bacilli could be cultivated from soil from an infected area and from sheep faeces from the area.

RUGGING OF SHEEP.—A trial on western plains country showed no significant difference in weight or condition between rugged and unrugged sheep and, although the fleeces from rugged sheep were of a higher commercial value than those of the unrugged, the fleece weights were lower.

EPHEMERAL FEVER.—A survey of the alleged sequelae of this disease was carried out. In general, the alleged after-effects were due to other causes, but a few cases of permanent nerve damage were seen. The survey showed that the outbreak caused extensive economic loss, chiefly by reduction in milk yield.

SWINE DYSENTERY.—Investigation of reported outbreaks of necrotic enteritis showed the presence of a hitherto unrecognized disease, swine dysentery, in New South Wales. Yeast feeding and rectal injections of copper sulphate solutions have been beneficial.

INFECTIOUS DISEASES CONTROL

CONTAGIOUS BOVINE PLEURO-PNEUMONIA.—An outbreak occurred in a mob of cattle introduced into a free area two years ago. The origin and course of the outbreak are discussed in detail and present an interesting study in epidemiology.

TUBERCULOSIS.—At the beginning of the year the scheme of control instituted under the authority of the Milk Board of New South Wales was commenced. This has had as its objective the testing of all cattle in registered dairy herds supplying raw milk in the Sydney and Newcastle districts.

The basis of the scheme has rested on the actual work of tuberculin testing being carried out by practitioners on an " approved panel ", according to conditions laid down by the Chief Veterinary Surgeon (Department of Agriculture).

" Elements in the machinery of organisation have been (a) tuberculin testing by either the double intradermal or subcutaneous tuberculin methods under supervision of Government veterinary officers; (b) the identification by eartags of all cattle tested, the eartag having on one side a crown and on the other a letter and numerals, the letter referring to an individual practitioner; (c) an official form of certificate issued only to approved practitioners; (d) a card index system operated at the central office and recording particulars of all tested animals, and, as far as possible, their histories and movements; (e) the regular chemical branding and slaughter under veterinary supervision at Homebush (Sydney) and Newcastle Abattoirs of all reactors to test; (f) the periodic checking and inspection of herds with the co-operation of supervisors of the Milk Board ".

Testing and re-testing have involved the carrying out of 37,000 tests on 28,000 cattle during the first year of the scheme. In the Sydney area there were 6·5% of reactors and in the Newcastle area, 4·6%.

PIROPLASMOSIS AND CATTLE TICK (*Boophilus australis*).—A full report of activities in the control of these conditions is given.

JOHNE'S DISEASE.—One outbreak is recorded.

SWINE ERYSIPELAS.—This disease is recorded for the first time in New South Wales.

BLACK DISEASE.—Field experience has demonstrated that the use of vaccine is indicated even at the height of a mortality and that losses from the disease subsequent to vaccination are negligible, seldom continuing for more than 10–12 days, and then at a lower rate. The disease appears to be spreading in the Murrumbidgee Irrigation Area. It is pointed out that the success of vaccination has resulted in some neglect of snail destruction work.

INTERNAL PARASITES OF SHEEP

Losses associated with practically pure infections with *Nematodirus* spp. are reported from the northern parts of New South Wales.

DISEASES OF POULTRY

Among the conditions briefly discussed are vaccination against LARYNGOTRACHEITIS and the use of carbon tetrachloride against intestinal ROUNDWORMS.

GENERAL

The report includes statistics relating to overseas quarantine, border control, export of stock, properties quarantined for lice and ked infestation of sheep, inspection of dairy herds, swine compensation act, suspect cattle despatched for slaughter and brief livestock figures.—H. McL. GORDON.

AUSTRALIA, QUEENSLAND. (1938). **Report of the Seeds, Fertilizers, Veterinary Medicines, Pest Destroyers, and Stock Foods Investigation Branch, 1937-38.** [COLEMAN, F. B.]—*Rep. Dep. Agric. Qd, 1937–38.* pp. 15 and 119–129. 2 tables.

The operation of the Veterinary Medicines Act during 1937–38 is briefly dealt with. As the Act has been operating satisfactorily for some years, full compliance with registration provisions is now being enforced. In consequence, a number of unregistered preparations have been withdrawn from sale.

Many veterinary preparations offered for sale in Queensland are manufactured overseas. As it would be unfair to enforce the disclosure of the formulae used by the manufacturers to their Queensland representatives, the submission of formulae —marked confidential—direct to the Veterinary Medicines Board has been accepted, provided that a declaration additional to that already required is received from the representative. The position with regard to the registration of such products is now regarded as satisfactory.—H. B. CARTER.

UNION OF SOUTH AFRICA, CITY OF JOHANNESBURG. (1940). **Report of Director of Abattoir and Live Stock Market Department for the period 1st July, 1938 to 30th June, 1939.** [KIRKPATRICK, A. C.] pp. 25. 11 appendixes. Johannesburg: Radford, Addington, Ltd. [fcp].

During the year, 853,771 animals were slaughtered and 1,020 tons of meat were condemned. The causes of condemnation were mainly (a) in cattle: emaciation, extensive bruising and tuberculosis; (b) in sheep: emaciation, caseous lymphadenitis, extensive bruising, jaundice and acute inflammation. The intestines of 47,783 sheep were condemned on account of infection with *Oesophagostomum columbianum*. Other causes of condemnation of viscera were echinococci,

flukes, caseous lymphadenitis, and, in pigs, cysticerci. The abattoirs are a source of supply of pathological specimens for the Onderstepoort Laboratory, the Medical Research Institute and the University of Witwatersrand. There is an insurance fund for the protection of owners against loss through condemnation after slaughter at the abattoir. The Department is responsible in addition for treatment of the animals of the Municipality, the Delta sewage farm and the Johannesburg Zoo. Veterinary inspection of 335 dairies was carried out, during which 15,151 cows were examined for TB. and other diseases of the udder: 250 samples of milk were examined at the municipal milk laboratory. The most common diseased conditions met with in the course of inspection of cows were mastitis, emaciation, mange, wounds and warts on the udder, and pyogenic abscesses. During the year 79 cattle and 257 pigs were found to be infected with TUBERCULOSIS, 1,228 cattle were infected with *Cysticercus bovis* and 6,322 pigs with *C. cellulosae*. There were eight cases of ANTHRAX.—J. A. GRIFFITHS.

BURMA. (1937). **Report on the Civil Veterinary Department for the Year ending the 31st March 1937.** [MITCHELL, D. T.] pp. 31. 7 tables, 2 graphs, 3 maps. Rangoon: Superintendent, Govt. Printing & Stat. [8vo] [Rs. 2—3s.]

The main work of the Department throughout the year in the field and in the laboratory was directed against contagious diseases and, in particular, against RINDERPEST. The staff treated 24,176 animals, mostly cattle, for non-contagious diseases. Rinderpest is controlled by the use of desiccated goat-spleen vaccine which is said to give good protection from the third day onward. It is used to immunize the cattle, not only in the "outbreak areas", but in the surrounding areas in order to form an immune belt around the outbreak. FOOT AND MOUTH DISEASE was prevalent, but the mortality was low. The incidence of ANTHRAX is declining, owing to the inoculation of animals with spore vaccine. Only three elephants died from this disease; two of these had not been inoculated and the third had been inoculated only a few days before. HAEMORRHAGIC SEPTICAEMIA vaccine gave good results. BLACKLEG caused some losses. SURRA was the cause of 115 deaths in equines. GLANDERS is enzootic in several places. In Maymyo the disease became epizootic and was suppressed by destruction of mallein reactors.

Students are given elementary training for the subordinate veterinary service at the Insein Veterinary College. A number of stipendiary students were studying at Indian veterinary colleges and two State scholars were sent to the British Isles to study veterinary science.

The Research Laboratory carries out a large amount of routine diagnostic work in addition to the preparation of vaccines. Research was in progress on diseases of elephants, and "kumri", dry coat and strangles in horses.

The total mortality from contagious and non-contagious diseases was 117,404 —a 1·91 % mortality rate.—J. A. GRIFFITHS.

NIGERIA. (1939). **Annual Report of the Veterinary Pathologist, 1937.** [METTAM, R. W. M.]—*Rep. vet. Dep. Nigeria, 1937.* pp. 29–30. 1 table.

The European staff of the laboratory consists of the Veterinary Pathologist, two veterinary research officers and three laboratory assistants. The work has been entirely the production of serum and vaccines, and no research work was carried out. The products in question were anti-rinderpest serum 22,170 litres, rinderpest spleen vaccine 120,710 doses, contagious bovine pleuro-pneumonia culture vaccine 319,620 doses, blackquarter vaccine 618,700 doses, anthrax vaccine 41,592 and anti-rabies vaccine 2,249 doses.—J. A. GRIFFITHS.

DUMFRIES (COUNTY). (1937). **Report of the County Veterinary Officer, 1936.** [SANGSTER, G. A.] pp. 13. 4 tables. [fcp]. [Mimeographed]

LANARK (COUNTY). (1938). **County Veterinary Officer's Report for the County of Lanark and the Burghs of Biggar and Lanark for the Year 1937.** [WEIR, J.] pp. 18. 5 tables, 1 graph. Glasgow: Robert Anderson & Sons Ltd. [8vo].

LONDON (COUNTY). (1939). **Report on Diseases of Animals by London County Council, 1937.**—*Rep. Lond. County Coun., 1937.* **2.** 16–17.

LONDON (COUNTY). (1938). [**Report of Work under the**] **Milk and Dairies (Consolidation) Act, 1915, and Tuberculosis Order, 1935 [London County Council, 1937].**—*Ibid.* **3.** Pt. I. 33–35. 4 tables.

	Work done under Milk & Dairies Order, 1926 & 1938. Milk & Dairies (Consolidation) Act, 1915 (Sect. 4). Milk & Dairies (Scotland) Act, 1914. Agriculture Act, 1937 (Sect. 4).							
	1	2	3	4	5	6	7	8
	Number in County.		Number examined (routine).		No. of cattle Tuberculin tested.	Percentage of reactors.	No. of cases of TB. found (excl. 6).	No. of cases of udder TB. found.
	Dairy Herds.	Cows.	Herds.	Cows.				
Dumfries	1,098	20,645	1,800		5,489	2·4	233	12
Lanark	1,230	29,920	3,694	89,763			170	110
London				2,545			9	
Somerset	7,770	260,000			14,413	8·4	225	23
Wiltshire								
1937		97,562	5,973	186,594			35	
1938		97,562	2,931	119,371	9,121	4·8	115	

NOTE.—A blank = " no information "; a dash = " no cases observed."

NEW ZEALAND. (1937). **Eleventh Annual Report of the Department of Scientific and Industrial Research for the Year 1936-37.** pp. 147. 8 tables, 15 maps. Wellington: E. V. Paul. [fcp] [3s. 6d.]

Work on cobalt content of soil in relation to " BUSH SICKNESS " was carried out in the two districts of Nelson and Morton Mains. It was found that the disease could be prevented either by cobalt drenches, cobalt salt licks or by top-dressing

SOMERSET (COUNTY). (1938). **Annual Report of the County Veterinary Officer for the Year 1937.** [TWEED, W.] pp. 8. 4 tables. Taunton: H. G. Mounter & Co. Ltd. [8vo].

WILTS (COUNTY). (1938). **Report of the Chief Veterinary Officer, Wilts County Council, 1937.** [GOLLEDGE, S. V.]—*Rep. med. Offr Hlth Wilts County Coun., 1937.* pp. 65–71. 5 tables.

WILTS (COUNTY). (1939). **Wilts County Council Inspection and Supervision of Food, 1938.** [GOLLEDGE, S. V.] pp. 66–72. 4 tables.

	Milk (Special Designations) Orders of 1923 & 1936. Number of Producers of Graded Milk.			Tuberculosis Order, 1925 & 1938.		Notifiable Diseases (still prevalent).				
9	10	11	12	13	14	15	16	17	18	19
No. of samples found to contain T. bac.•	T.T. (certified).	T.T.	Accredited.	No. of cases of TB. (excl. 14).	No. of cases of udder TB.	Anthrax.	F. & M. Disease.	Swine Fever.	Mange.	Sheep Scab.
7	1	47	1	—	—					
124	19	62	2	257	138					
135						2	—	4	8	
37	—	166	527	184	41	14	—	24	—	—
138		104	689	219	134					
21		117	799	165						

of pasture with Co [for details see *V. B.* **7.** 297 and 485; **8.** 604 and 723]. A cobalt survey of New Zealand soils was also carried out and some early results are given.

At Canterbury Agricultural College MILK FEVER was cured by 20% calcium gluconate dissolved in 5% boric acid solution. SORREL POISONING of ewes was investigated biochemically: it was found that the blood Ca content was considerably reduced. Affected sheep become comatose and may be saved by calcium gluconate.

—J. E.

NORTHERN RHODESIA. (1939). **Annual Report of the Veterinary Department for the Year 1938.** [MORRIS, J. P. A.] pp. 60. 16 tables, 3 appendixes. Lusaka: Govt. Printer. [fcp] [2s. 6d.]

The staff consisted of the Director, Deputy Director, Veterinary Research Officer, and six district veterinary officers assisted by a number of stock inspectors. Expenditure was £27,333.

LIVESTOCK INDUSTRY.—144 head of breeding stock, 3,321 head of slaughter cattle, and 905,088 lb. of frozen meat were imported. A "Memorandum on the Development of the Native Cattle Industry" was approved by a Native Development Board constituted in 1938. The scheme involves the creation of a Livestock Division of the Veterinary Department, the personnel of which would be exclusively employed in the improvement of animal husbandry methods among the native cattle population.

ANIMAL DISEASES.—Eight outbreaks of ANTHRAX, and 34 outbreaks of BLACKLEG were reported and dealt with by quarantine and vaccination. Half-yearly vaccination of young stock on blackleg-infected farms is recommended. CONTAGIOUS ABORTION is enzootic. BOVINE TUBERCULOSIS in indigenous cattle occurs in the Fort Jamieson district, being probably a legacy from cattle movements during the Great War. All imported cattle are now tuberculin tested when passing through the Maramba quarantine area. A number of reactors was found amongst cattle with clean certificates from exporting countries, and the presence of TB. was confirmed at autopsy. No cases of GLANDERS occurred. BRONCHO-PNEUMONIA of sheep caused some losses, and was usually associated with dipping. Occasional outbreaks of FOWL TYPHOID occur; vaccination is practised. BACILLARY WHITE DIARRHOEA occurred in several batches of imported chicks and has become a serious menace to the poultry industry. Remarks on EAST COAST FEVER, ANAPLASMOSIS, and PIROPLASMOSIS are similar to those in the 1937 report [*V. B.* **8.** 480]. An extension of tsetse fly in the Namwala district was associated with movements of wild buffalo. Mortality from TRYPANOSOMIASIS has been less, probably owing to the response of native stock-owners to the advice given to move cattle away from "fly" areas. Administration of 3–4 oz. of bone-meal daily, and the provision of veldt hay and ensilage to trypanosome-infected cattle is recommended. The territory remained free from RINDERPEST and FOOT AND MOUTH disease. Fifteen outbreaks of RABIES were reported, but the figures do not give a true picture of the incidence. Lack of funds again prevented the carrying out of control schemes previously planned. Eighty-seven outbreaks of HEARTWATER were recorded. Cases of SWEATING SICKNESS of calves were noted. There were no cases of AFRICAN HORSE SICKNESS despite an increase in the equine population; the Onderstepoort vaccine was again used. Forty-six outbreaks of STREPTOTHRICOSIS occurred; treatment was by mange dressings and intravenous injections of tartar emetic. A peculiar skin disease of cattle, last seen to any extent in 1930, occurred in the Abercorn district. The name given to this condition is "PSEUDO-URTICARIA"; the symptoms are described and some observations on the disease are given. The year marked the commencement of the large-scale field campaign for the eradication of CONTAGIOUS BOVINE PLEURO-PNEUMONIA from the Barotse Province. This work followed the experimental work of PURCHASE [*V. B.* **9.** 705.] which indicated that Kenya culture virus was innocuous to Barotse cattle and that immunization was successful. During the year, nearly 36,000 head were double- or treble-inoculated, representing about 26% of the total cattle population of the Barotse Province. Though it is too early to form a complete judgement, results to date have been distinctly encouraging.—H. E. HARBOUR.

NORTHERN RHODESIA. (1939). **Annual Report of the Central Research Station, Mazabuka, for the year 1938.** [LE ROUX, P. L.]—*Rep. vet. Dep. N. Rhod. 1938.* pp. 40–60.

Lack of staff and funds again seriously hampered research. There was a marked increase in the number of blood and organ smears, pathological specimens, etc., submitted for examination. The general health of the various herds of breeding cattle maintained on the station was good. Non-specific OPHTHALMIA was the most serious condition in these animals, 85 cases being dealt with. Ticks caused some trouble, while LIVER FLUKE infestation was common. A serious outbreak of MASTITIS occurred; treatment with trypaflavine and entozon gave better results than with acriflavine, the latter causing oedema and cessation of milk secretion. A three-quarter bred Ayrshire calf died within three days of birth from ANAPLASMOSIS. The dam showed no sign of infection and this is thought to have been a case of intra-uterine infection contracted early in foetal life.

Some experiments on immunization of imported cattle against REDWATER and ANAPLASMOSIS suggest that the local strains of *Babesia bigemina* and *Anaplasma marginale* are too virulent for use in vaccination. Cattle coming from known redwater and gall sickness veldt in the south are known to be resistant to the local strains, and owners are advised to have stock immunized with the Union of South Africa or Southern Rhodesian redwater and gallsickness vaccines before importation. Acaprin, though valuable in treating redwater, was found to have no effect in anaplasmosis. HELMINTH INFESTATIONS cause serious losses especially in cattle and sheep. Notes are included indicating the species of worms involved. The Union of South Africa Government "nodular worm remedy" is being used, but its efficiency is reported to be considerably reduced during the dry season.

Comment is made on the inadequate attention generally given to the care of cattle. Dipping is often carelessly done and many tanks are faultily constructed; calves suffer from over-milking of the dams. Improved water supplies are required; on some farms this has received attention with good results. The poultry industry continues to expand, and the appointment of a whole time poultry husbandry officer is considered desirable.—H. E. HARBOUR.

JAMAICA. (1939). **Report of the Senior Veterinary Officer for the Year 1938.** [LOCKETT, S.]—*Rep. Dep. Agric. Jamaica, 1938.* pp. 32–41.

The Department's activities include the operation and maintenance of the stock farm at Hope and the stud farm at Grove Place in Manchester, field services among stock breeders and small settlers in collaboration with the Jamaica Agricultural Society, and control of animal diseases. SWINE FEVER and BLACKLEG, occurring sporadically, were the only infectious diseases reported. Annual vaccination against ANTHRAX has prevented losses. Poisoning by Jamaica nightshade (*Urechites sub-erecta*), which is very generally distributed in the pastures, has become a menace to livestock, especially cattle. The incidence of TUBERCULOSIS and CONTAGIOUS ABORTION on the Government stock farm is very low. Excessive ingestion of guavas by cattle is said to have caused profuse salivation, eruptions on the body, general muscular stiffness and poor condition. This was attributed to the high tannic acid content of the fruit, which caused constipation.—J. A. G.

ANTIGUA. (1940). **Annual Report of the Veterinary Officer for 1938.** pp. 4. 4 tables. Antigua: Govt. Printing Off. [fcp] [2d.]

TUBERCULOSIS was the most important disease causing losses. The mortality

was mainly among working cattle. Tuberculin tests gave positive reactions in 29% of working cattle, 22% of dairy cows and 20% of the breeding herd cows. TB. was also very prevalent in pigs and poultry. CONTAGIOUS ECTHYMA was observed in goats and sheep. TETANUS and STRANGLES in equines, and FOWL TYPHOID, FOWL POX and ROUP were prevalent.—J. A. GRIFFITHS.

DENMARK. (1939). Aarsberetning fra Veterinaerdirektoratet for aaret 1938. [**Report of the Veterinary Directorate for 1938**]. [PETERSEN, G. H.] pp. xx+183. Numerous tables, 1 graph, 1 map. Copenhagen: Trykt i A. Johansens Bogtrykkeri. [8vo].

The outbreak of FOOT AND MOUTH disease mentioned in the previous year's report [*V. B.* **10.** 66.] spread so intensely that the policy of control by emergency slaughter had to be waived in October. During the ensuing eight months the disease continued to spread until 54% of all herds in Denmark had become infected. Convalescent serum from Riems, Germany, convalescent blood from the Serum Laboratory, Copenhagen and vaccine [evidently $Al(OH)_3$-adsorbed virus] prepared in Denmark were all used separately to a limited extent [*V. B.* **10.** 507 and 509]. [Records suggest that they did little to check the wave of infection or to lessen mortality]. Mortality was about 0·55% in affected full-grown cattle, 0·28% in young cattle, and 5·7% in calves, total deaths numbering 30,299 head of cattle, 44,641 swine, 245 sheep and 25 goats. An account of the cost of control is given; the total was 11 million kronor, of which 7 million went in compensation for slaughter of 615 herds. A table shows the number of Danish herds infected with F. & M. disease from 1890–1939 (October).

There were 30 outbreaks of malignant FOOT-ROT in sheep; 21,520 kr. were paid in compensation for compulsory slaughter.

In the campaign against bovine TUBERCULOSIS, 760 cows were slaughtered on account of open TB. 11,440 herds were tuberculin tested and 6,078 of them proved to be free from infection. Tests on special dairy herds showed that 21% of 11,200 contained reactors (percentage of reactors for animals tested was 5·9).

1,274 blood samples out of 5,150 tested were positive for BRUCELLA INFECTION.

The following numbers of outbreaks and affected animals (in brackets) refer to other important diseases: STRANGLES 1,586 (4,323), ANTHRAX 58 (78), SWINE ERYSIPELAS 1,104 (3,053), SWINE PLAGUE 2,010 (13,358), CALF DIPHTHERIA 193 (873), BLACKLEG 18 (19), RINGWORM 1,067 (5,344), EQUINE PUSTULAR STOMATITIS 28 (81), COW POX 385 (3,759), EQUINE GENITAL VESICULAR EXANTHEMA 21 (21), DOG DISTEMPER 972 cases, EQUINE MANGE 13 (33), EQUINE INFECTIOUS PARAPLEGIA 10 (17), PURPURA in horses 96 (100), BOVINE ENZOOTIC MENINGITIS 8 (23) and BOVINE MALIGNANT CATARRH 33 (65).

Nine thousand fowl carcasses were received for diagnosis: TUBERCULOSIS was determined in 364, PULLORUM disease in 30, FOWL TYPHOID in 13, LEUCOSIS in 378 and FOWL PARALYSIS in 99.

Notes are also given on various other diseases, parasitic diseases and cases of poisoning. Over half the report is devoted to reprints of veterinary laws, notices and circulars issued during the year.

For the first time since 1934 a note on veterinary personnel is included. There were 1,168 Danish veterinarians: 734 were in practice, 573 of these being also engaged in meat inspection; 139 were engaged exclusively in meat and milk inspection, 58 in carcass destruction plants, 260 in livestock market inspection, 25 in veterinary education, 15 in research, 11 in army work, 30 in veterinary administration and two as consultants in horse breeding [there is evidently some overlap].

—J. E.

SWEDEN. (1939). Der civila veterinärväsendet år 1938 av kungl. medicinalstyrelsen. **[Report of the Civil Veterinary Department for 1938].** [FRYKHOLM, N.] pp. v+49. 16 tables. Stockholm: Kungl. Boktryckereiet P. A. Norstedt & Söner. [8vo] [French summary].

STATE VETERINARY BACTERIOLOGICAL INSTITUTE.—Changes have been made in the administration and the management has been taken over by the civil veterinary department. Professor Wall, the former director, left in November, 1938. Particulars of the staff budget and work (diagnostic and biological product preparation) are given.

VETERINARY PERSONNEL.—The number of qualified veterinarians in Sweden was 611. Twenty-three were engaged in civil veterinary administration, 21 as teachers, 28 in the army, 288 as provincial and district veterinary officers, 48 with breeding studs and agricultural societies, 251 in food inspection and the rest variously, including 96 in private practice.

LIVESTOCK DISEASES.—FOOT AND MOUTH disease was the chief source of loss, infection entering the country in May from Germany and in August from Denmark. 4,377 herds became infected and 856 were slaughtered in an attempt to stamp out the disease; this, however, failed, so that control by isolation and serum treatment was adopted in November.

For the control of bovine TUBERCULOSIS 220,847 cattle were tuberculin tested for the first time, the percentage of reactors being 6·5. Of 452,725 cattle retested, 1·4% reacted. 86% of the former group of herds and 91% of the latter group were "clean". 34% of 34,149 lung mucus samples, 3% of 10,236 milk samples and 8·7% of 1,975 vaginal mucus samples, were positive on test for TB. 1,051 cows with open TB. were slaughtered and compensation granted.

There were 69 cases of ANTHRAX, 9 outbreaks of FOWL TYPHOID, 1,837 herds in which BRUCELLOSIS was known to be present, 13 cases of BLACKLEG and 1,187 cases of EQUINE INFECTIOUS ANAEMIA.

VARIOUS.—Statistical information is given of animals treated for disease in the several provinces, meat inspection and export, and milk inspection.—J. E.

UNITED STATES OF AMERICA. (1938). **Report of the Work on Animal Pathology of the Division of Extension Work in Agriculture and Home Economics of the Michigan State College, 1937-38.** [KILLHAM, B. J.]—*Rep. Mich. Bd Agric. 1938.* pp. 158–159.

CONTAGIOUS ABORTION of cattle has been controlled for four years, and it is estimated that the number of infected cattle in the state has decreased from 15% to 10%. About 4,000 accredited herds were added during the year.

Other activities included the control of horse parasites, the improvement of the general health of farm animals and the control of other contagious diseases.
—J. C. WALLACE.

BOOK REVIEWS

UDALL, D. H. [B.S., D.V.M., D.Sc., Professor of Veterinary Medicine and Superintendent of the Ambulatory Clinic in the New York State Veterinary College at Cornell University]. (1939). **The Practice of Veterinary Medicine.** pp. ix+672. 102 figs. [Numerous refs.] Ithaca, New York: The Author. [3rd Edit.] [8vo] [$6].

The favourable reception which the earlier editions of this book have received has made necessary a third edition after only three years. In the preface the author states that he has endeavoured to present concise and systematic descriptions of the various internal diseases of herbivorous animals and swine and there can be little

doubt that he has achieved his purpose. The *format* of the book has been improved, the printed matter has been increased about 20% and 21 additional illustrations have been introduced. It is very well written, most interesting to read and an excellent reference book for the busy practitioner. Each of the diseases described is followed by a list of references and in the case of those diseases which prevail in the vicinity of New York State, the author has been able to draw upon his own personal experience and also that of his colleagues in the Cornell Ambulatory Clinic.—GWILYM O. DAVIES.

BUSHNELL, L. D. [B.S., M.S., Ph.D.], FRICK, E. J. [D.V.M.], & TWIEHAUS, M. J. [D.V.M.] (1940). **Poultry Practice. A Collection of Discussions on Poultry Diseases and Related Subjects. Reprinted from Veterinary Medicine, December, 1939 et seq.** pp. 160. Numerous figs., tables, photographs. [Numerous refs.] Chicago: Veterinary Magazine Corporation. [4to] [$1.00].

The subject matter of this book is presented in a rather unusual way. It comprises 34 separate articles, which have been published in *Veterinary Medicine*. Many of the names of the authors of the articles are familiar to those conversant with the literature on poultry disease and its control, and they have written upon subjects on which they are recognized authorities.

The following list includes some of the titles:– tuberculosis of chickens, infectious laryngotracheitis, lymphomatosis, fowl pox, fowl cholera, fowl typhoid, paratyphoid infections in birds, botulism, and pullorum disease. Other articles include those on the helminths of poultry, nutritional diseases of poultry and the diseases encountered in game birds. The technique of poultry P.M. examinations and the P.M. diagnosis of the more common poultry diseases are dealt with adequately. A useful article on poultry hygiene and sanitary measures is included. The U.S.A. government plan for the control of pullorum disease is outlined. In addition to the tube agglutination test, two rapid methods—one serum, and the other whole blood and stained antigen—are recognized by official authority for use in this scheme.

Some of the disease control measures employed are not applicable to the United Kingdom, *e.g.*, seasonal vaccination with a live virus is permitted in the United States for the control of infectious laryngotracheitis.

Many of the photographs are good. This book should prove of value to all veterinarians interested in the diseases of poultry.—L. E. HUGHES.

MILKS, H. J. [D.V.M., Professor of Therapeutics and Director of Small Animal Clinic, New York State Veterinary College at Cornell University, Ithaca, N.Y.] (1940). **Practical Veterinary Pharmacology, Materia Medica and Therapeutics.** pp. xiii + 620. 32 figs., 2 plates. London: Baillière, Tindall & Cox. [4th Edit.] [8vo] [35s.]

This edition is a great improvement on that published three years ago and includes a considerable number of relatively recent additions to the list of therapeutic agents, among which are mandelic acid and sulphanilamide. The preparations of drugs mentioned are of course those of the United States Pharmacopoeia and the National Formulary and are therefore not necessarily identical with similarly named preparations of the British Pharmacopoeia or B.P. Codex. More might have been made of the consideration of sulphanilamide and sulphapyridine, but both are dealt with in the space of only three pages.

Any criticism, however, can only be on minor matters and the aim of the author to make it a text-book for veterinary students and practitioners is amply attained.—W. J. IRONSIDE.

WEIL, P. É. [Médecin des Hôpitaux de Paris]. (1939). L'hématologie clinique et laboratoire. **[Clinical and Laboratory Haematology].** pp. 268. 46 figs., 12 plates. Paris: Masson et Cie. [8vo] [18s.]

As W. states in his introduction, this book does not claim to be a complete exposition of haematology. The subject is treated in two ways, *viz*, the technique of the examination of the blood, and the study of the blood of patients suffering from diseases of the blood. The book is divided into two parts according to the above plan. The illustrations by CONSTANTIN are particularly good and they are an attractive feature of the publication. The text does not appear to contain any new material which cannot be obtained in similar English publications.—D. L. H.

KÜPFER, M. (1937). Backzahnstruktur und Molarentwicklung bei Esel und Pferd. **[Development and Structure of Molar Teeth in Donkeys and Horses].** pp. xv+204. 16 text figs., 35 plates. [Numerous refs.] Jena: Verlag von Gustav Fischer. [8vo] [RM. 50].

The author contributes a valuable addition to the general knowledge of equine odontology.

It is divided into two sections. The chief section deals with the development and general structure of molar teeth from the time of their first appearance in the embryo until fully developed. The supplementary section is concerned with the normal eruption of both molars and incisors. As this section consists almost entirely of X-ray plates and their legends, the reader is enabled to see, not only the rate and order of eruption above the line of the dental alveolus, but also the behaviour of the growing tooth before it appears in the cavity of the mouth.

The normal process of wear is discussed. In this connexion there are three excellent X-ray plates, taken in horizontal projection, which show the degree of lateral deviation possible between the two jaws, as well as the degree of superimposition when the jaws are in the normal position.

A short section deals with the comparative embryological features which exist in accordance with the requirements of the perisso-dactyla as opposed to the ruminant artio-dactyla.

This book is recommended to all interested in the embryology, histology, and eruption of the teeth of the horse.—C. W. OTTAWAY.

RADLEY, J. A. [M.Sc., A.I.C.], & GRANT, J. [Ph.D., M.Sc. F.C.I.] (1939). **Fluorescence Analysis in Ultra-Violet Light.** pp. xvi+424. 21 figs., 31 tables, 28 photographs. [Numerous refs.] London: Chapman & Hall. [3rd Edit.] [8vo] [25s.]

In this third edition the authors carry out the urgent task of making an expert review of the considerable recent literature on fluorescence analysis. The science is still in an early stage and much conflicting information has been published, as is strikingly evident from a perusal of quoted results and opinions throughout the book.

Part I deals with theory and technique including fluorescence microscopy, and part II with fluorescence analysis in 20 different sciences or industries. Much of this is indirectly of veterinary interest, especially in the fields of veterinary biochemistry and pharmacology, *e.g.* with reference to the identifications of chemical substances in the pure and compound state. A little information is also given on the fluorescence colours of micro-organisms and on the identification of body fluids or stains thereof in medico-legal work.

The book is the only one of its kind in the English language and as such is very valuable as an authority on the subject, particularly because each chapter is concluded by a reference list. The printing is excellent.—J. E.

BECK, C. [C.B.E.] (1938). **The Microscope. Theory and Practice.** pp. 264. 217 figs., numerous tables. London: R. & J. Beck, Ltd. [8vo] [7s. 6d.]

The purpose of this book, a combination of the author's two previous books with a considerable amount of new matter in addition, is to enable the user of a microscope to obtain the best results from his instrument. The author rightly points out that the use of the microscope is not entirely simple but that with a modern instrument there is no mystery about it. A small amount of mathematics is involved but only sufficient to give an understanding of basic principles. These basic principles are discussed and their practical applications are described, together with details of technique, apparatus for direct and dark ground illumination, including microscopes for special purposes, and polarized light as applied to microscopy.

The book should certainly be studied by all those who use fine microscopes. Good microscopes are necessarily expensive and if used without adequate knowledge will not function any better than inferior instruments and are likely to deteriorate rapidly. There is little point in acquiring a first-class instrument unless the user acquires the knowledge necessary to make full use of it.—G. SLAVIN.

MATHESON, R. [Professor of Entomology, Cornell University]. (1939). **A Laboratory Guide in Entomology. For Introductory Courses.** p. vii+135. 4 figs., 48 plates, 2 tables, 1 appendix. [Numerous refs.] Ithaca, N.Y.: Comstock Publishing Company, Inc. [4to] [$2.0].

As the title suggests, this book is intended for the use of students taking an introductory course in practical entomology. The structure and identification of insects form the greater part of the subject matter, which is illustrated with numerous line drawings. There is a short appendix dealing with the collection, preservation and rearing of insects.—R. P. HOBSON.

HUDDLESON, I. F. [D.V.M., M.S., Ph.D., Research Professor in Bacteriology, Michigan State College]. (1939). **Brucellosis in Man and Animals.** pp. xxi+339. 40 figs., 31 tables, 1 photograph. [Numerous refs.] London: Humphrey Milford, Oxford University Press; New York: The Commonwealth Fund. [8vo] [19s.]

This work is a revised and enlarged edition of the author's previous book [*V. B.* **4.** 494]. Notable additions consist of a description of human brucellosis (over 100 pages) and a more extensive description of the disease in animals. The section on the disease in man has been written with the collaboration of HARDY and DEBONO and an appendix of human case reports is also added.

The book is one which ought to be within easy reach of all workers on brucellosis and, whilst frequently expressing the personal viewpoint and methods of the author, it provides a wealth of useful and detailed information.—S. J. GILBERT.

MICHEL-BÉCHET, R. [Ancien Interne des Hôpitaux de Paris, Associé national de l'Académie de Chirurgie], PUIG, R. [Ancien Interne des Hôpitaux de Lyon, Ancien Chef de Clinique à la Faculté], & CHARVET, P. [Ancien Interne des Hôpitaux de Lyon, Ancien Chef de Clinique adjoint à la Faculté]. (1939). Localisations viscérales et aspects chirurgicaux des brucelloses. [**Visceral Localization and Surgical Aspect of Brucella Infections**]. pp. 168. 20 figs. Paris: Masson et Cie. [8vo].

This work is confined to brucellosis of human beings, and it describes the lesions of surgical interest caused by the disease.—S. J. GILBERT.

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

The latest list of the publications indexed for this purpose was included in *Index Veterinarius,* Vol. 6, No. 1 (issued December, 1938) and also circulated with the *Veterinary Bulletin,* Vol. 9, No. 1.

About 10,000 references are indexed each year, each reference being suitably cross-indexed alphabetically under subjects and under names of authors.

As each half-yearly issue consists of a single complete alphabetical index of subjects and authors' names, a search through it involves a minimum of trouble, and all information required is readily found.

Each number contains the indexing done by the Bureau during the previous half-year, *i.e.,* No. 1, issued in December, covers the indexing done during the previous January to June.

The dates of issue of the two numbers of each volume are as follows:—

No. 1.—Issued December. Indexing period previous January—June.
No. 2.—Issued June. Indexing period previous July—December.

Vols. 1 to 3 (1933, 1934 and 1935) of the Index were produced on a duplicator; from Vol. 4 onwards it has been printed.

Vols. 1 to 5 were issued in quarterly parts; the issue is now half-yearly.

Annual Subscription, £5.

A limited number of copies printed on one side only are available for those who wish to mount references on cards.

Orders may be sent to:—

IMPERIAL BUREAU OF ANIMAL HEALTH,
NEW HAW, WEYBRIDGE,
SURREY, ENGLAND.

IMPERIAL AGRICULTURAL BUREAUX

Imperial Bureau of Dairy Science

Shinfield, Reading, England

DAIRY SCIENCE ABSTRACTS

A comprehensive collection of abstracts of current literature dealing with milk and dairy products: husbandry, technology, control and standards, economics, physiology, bacteriology and mycology, chemistry and physics. Published quarterly. Subscription 25s. per volume of 4 numbers (5s. discount to British subjects who subscribe direct): single copies, 7s. 6d.

Technical Communications

No. 1. The phosphatase test for control of efficiency of pasteurisation. H. D. Kay, R. Aschaffenburg and F. K. Neave. Price 2s. (postage 2d. extra).

Imperial Bureau of Animal Nutrition

Rowett Institute, Aberdeen, Scotland

NUTRITION ABSTRACTS AND REVIEWS

Consists of abstracts of papers published throughout the world dealing with the subject of nutrition in all its aspects. They are arranged under the following sections: technique (including chemical and experimental methods), composition of food, physiology of nutrition, human diet in relation to health and disease (including dietary studies, food economics, deficiency diseases and therapeutic dietetics), feeding of animals and book reviews. Each issue also contains a review article on some subject of general interest.

Published quarterly. Annual subscription 42s.

Technical Communications

These are published at irregular intervals, price 1s.

Imperial Bureau of Animal Breeding and Genetics

King's Buildings, University of Edinburgh

ANIMAL BREEDING ABSTRACTS

This journal contains abstracts and reviews of current publications bearing on animal breeding, genetics, production, sex physiology, reproduction and cognate subjects. Published quarterly. Subscription rate, 25s. per annum.

Occasional Communications and *Bibliographies* are also issued from time to time.

Imperial Bureau of Pastures and Forage Crops

Agricultural Buildings, Alexandra Road, Aberystwyth

This Bureau covers current literature on grassland, forage crops and plant biological research, and issues two quarterly publications:—

HERBAGE ABSTRACTS and HERBAGE REVIEWS

The latter publication contains original articles and reviews on topics which merit more detailed consideration than can be given in the former.

Subscription rates: *HERBAGE ABSTRACTS.* 25s. per annum (single parts, 7s.).
HERBAGE REVIEWS. 15s.* per annum (single parts, 4s.).

*A reduction of 5s. will be made when *HERBAGE ABSTRACTS* is also ordered.

At irregular intervals larger monographs are published on miscellaneous subjects in the form of *Bulletins*.

Printed in Great Britain by H. R. Grubb, Ltd., Croydon.